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SOFTWARE REQUIREMENTS SPECIFICATION FOR THE DEFENSE INFORMATION INFRASTRUCTURE (DII) COMMON OPERATING ENVIRONMENT (COE) COMMON SUPPORT APPLICATIONS

Kathy Jordan, *task leader*

Clyde Roby
Ed Feustel

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INSTITUTE FOR DEFENSE ANALYSES
1801 N. Beauregard Street, Alexandria, Virginia 22311-1772

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CHAPTER 1. Scope

1.1 Identification

This document describes software requirements for the Defense Information Infrastructure (DII) Common Operating Environment (COE) common support applications services: Alert Services, Track Correlation Management Services, Joint Mapping Tool Kit (JMTK) Services, Message Processing Services, Office Automation Services, and On-Line Support Services.

1.2 System Overview

The DII COE is intended for use by all Department of Defense Command and Control Systems as the infrastructure on which they reside. The COE consists of an integrated architecture made up of hardware and software which provides standard, modular, system support and application support software for a tailorable set of functional application software.

This document specifies the software requirements for the DII COE.

Service and agency unique requirements are outside the scope of this document.

The requirements in this document apply to software developed for the DII, contributed to the DII, or licensed for use within the DII. This document applies to software within the DII COE, Common Support Applications, and service-specific or mission-specific applications.

1.2.1 Alert Services System Overview

Alert Services functional area provides generic mechanisms for alerting a process. When a process has determined that a predefined criteria or event has occurred for notifying other processes, that process shall use the Alert Services software to notify all interested processes of the event. Alert Services software is composed of an Alerts Server mechanism and a generic Alerts Display mechanism. The Alerts Server allows processes to register to create and receive alerts. The server distributes Alerts using the COE communications support and ensures that Alerts are delivered when issued. The Alerts server supports the requests of client applications and the generic display tool. The Alerts Display tool is a generic display tool for viewing Alerts. The tool is not intended to be the primary means of displaying the Alerts. It is a generic means of displaying alerts more for diagnostics than general use. The Application Programming Interfaces (APIs) provide for access to all display and server functionality.

1.2.2 Track Correlation Management Services System Overview

The Track Correlation Management Service is a COE Common Support Layer module. It is designed to provide both an automated and an interactive type of data management service known as correlation. Correlation is technically defined as the process of taking a new input (called a contact), comparing it to a database of previous inputs (called tracks), and deciding whether the new input is updated/revised information about an existing track or is a new, previously unreported input that should be added as a new record in the database. In this context, correlation includes front-end data conditioning, correlation, submission of new records for insertion, and combination of new inputs with existing database records to produce a new resulting record. In addition, user interaction with the data for analysis and maintenance is provided.

Correlation is not exclusively the domain of intelligence. Correlation is intended to be used by any process or mission application that maintains a resolved set of data that should be updated by new inputs. A non-intelligence example would be maintenance of a database of Global Positioning Satellite (GPS) transponder positions, updated in a dynamic fashion. Correlation of data from cooperative sources - ones that fully and uniquely identify the entities being tracked (like GPS) - could commonly be called

"filing". Correlation of data from non-cooperative sources - such as enemy tracking reports - requires a more advanced approach, involving computational algorithms to process content within inputs as part of a decision making process.

Correlation is the first step of a larger process classically called data fusion, with the other steps being situational analysis, threat analysis, and processing refinement [JDL Data Fusion Model]. The intent of the Track Correlation Management Service is to provide automated support for correlation only; the requirements for the remaining levels of data fusion vary widely between the military services and should remain (at least for now) as mission applications.

Correlation is not the same as "common picture" or "battlefield visualization". It does share databases with those services, and it provides mechanisms for enforcing a common picture and permitting distributed contact data management across a theatre of operations. Ultimately, the Track Correlation Management Service provides a function that produces the "correlated" data set which can be used/viewed by its own display, manipulation, and data management services, or by any other COE segment/mission application desiring to use such data.

The following terms are employed throughout this document, working definitions are provided for completeness and for reference

ENTITY
a uniquely identified object (a unit, a piece of equipment, a person, a facility, a manmade feature, or a natural feature) that exists.

IDENTITY of an ENTITY
an attribute or a set of attributes that allow an entity to be uniquely specified and distinguished from other entities.

CONTACT
an observation of one or more attributes of an entity (whose identity may not have been among the contact's attributes).

TRACK
a set of contacts. A track inherits estimated attributes from the attributes of its constituent contacts. Contacts with the set may exhibit variable attribute values. This document discusses a two tiered track structure - high level tracks that represent sets of contact reports that are assessed to correspond to a single entity, and low level, or reporting domain tracks, that share common parametric or attribute data. Low level tracks typically derive from a common reporting source and are often subject to domain specific correlation processing. It is always the case that a high level track may consist of the union of low level tracks that nonetheless retain their individual identities.

CORRELATION
the process of deciding whether a contact either belongs to an existing track or represents a new track (or may be ambiguous given available information).

CORRELATOR
the implementation of a correlation decision and the resulting database actions, either inserting a new record or updating an existing record.

ASSOCIATION
the process of linking an entity and a track; the determination of the identity of a track (Editor's Note: This definition is not in concert with the definition of association held in the JDL DFM and classic data fusion texts which use the term assignment for the process of linking an entity and a track).

It is recognized that these definitions [except where noted] are similar to but not exactly the same as in the JDL Data Fusion Lexicon. The intent was to develop a working set of terms to provide a common reference for software system developers from all services; these definitions represent a consolidated proposal from the major service tactical intelligence system developers.

The following figure provides an illustration of these concepts.

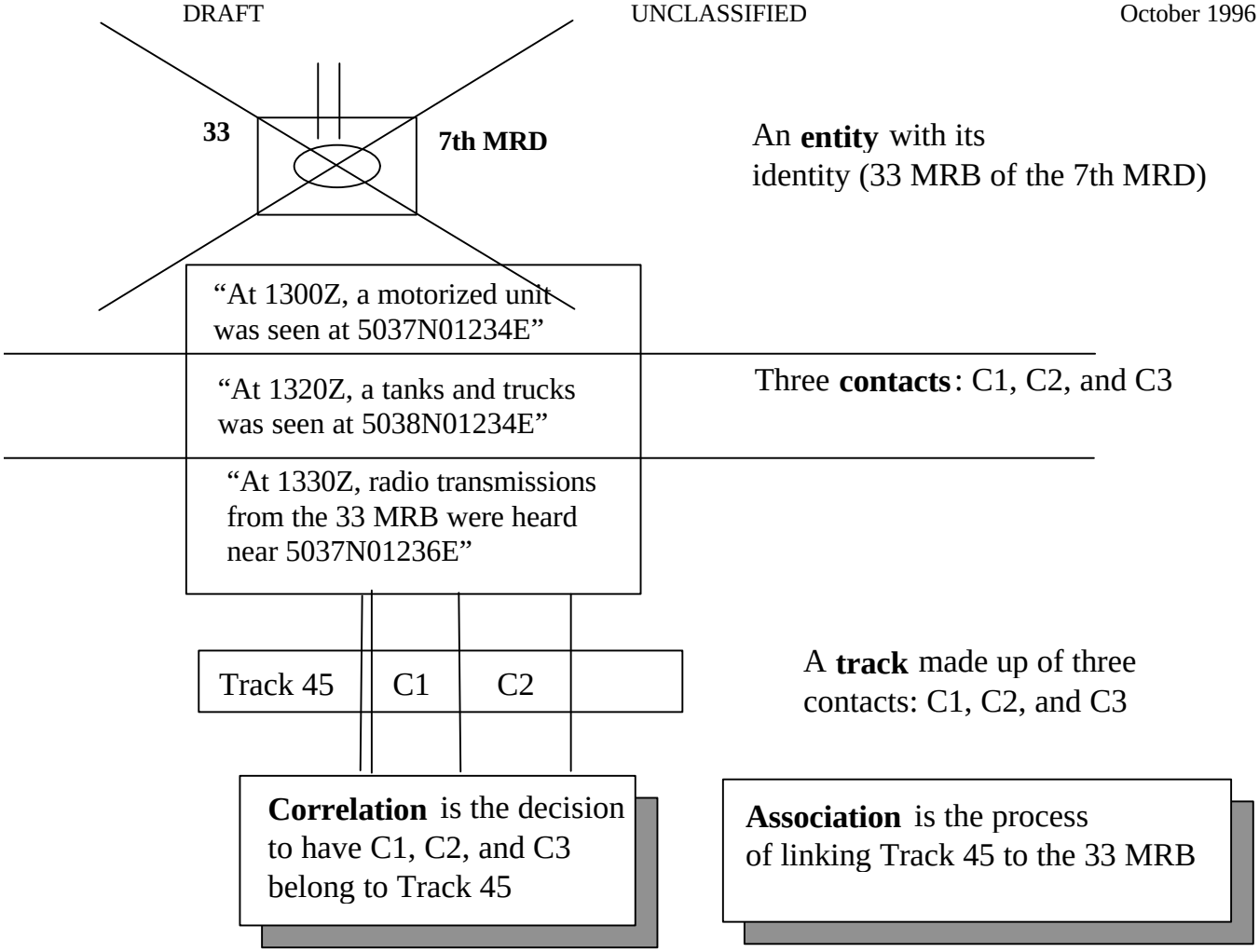

Figure 1. Track Correlation Concepts

1.2.3 Joint Mapping Tool Kit (JMTK) Services System Overview

This document includes the Mapping, Charting, Geodesy, and Imagery (MCG&I) functional area which is now commonly referred to as the Joint Mapping Tool Kit (GCCS/JMTK). The GCCS/JMTK is one of 19 functional components comprising the Global Command and Control System (GCCS) Common Operating Environment (COE) (See Figure 2. GCCS COE Architecture). The GCCS/JMTK is considered a common support application.

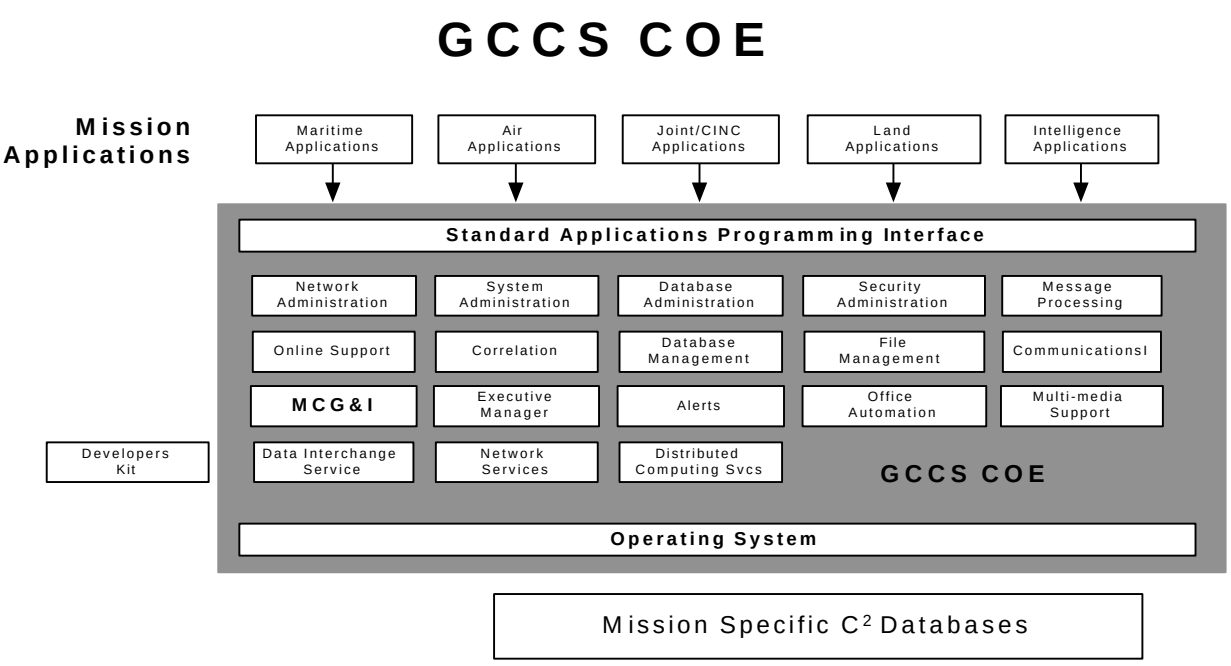

Figure 2. GCCS COE Architecture

GCCS/JMTK is a program sponsored by the Defense Mapping Agency (DMA) to integrate existing DoD software into a tool kit which will meet the mapping, charting, geodesy, and imagery (MCG&I) requirements of DISA's GCCS. The GCCS/JMTK will provide standard MCG&I data and exploitation capabilities as a functional area for the GCCS COE. DMA's implementation strategy is primarily based upon evolutionary migration. Because each of the three military services has software products that perform identical functions, the GCCS approach was to use the best of each and integrate these components into the 3.0 delivery of GCCS/JMTK. Figure 3. GCCS/JMTK Architecture 3.0 shows the GCCS/JMTK 3.0 Architecture.

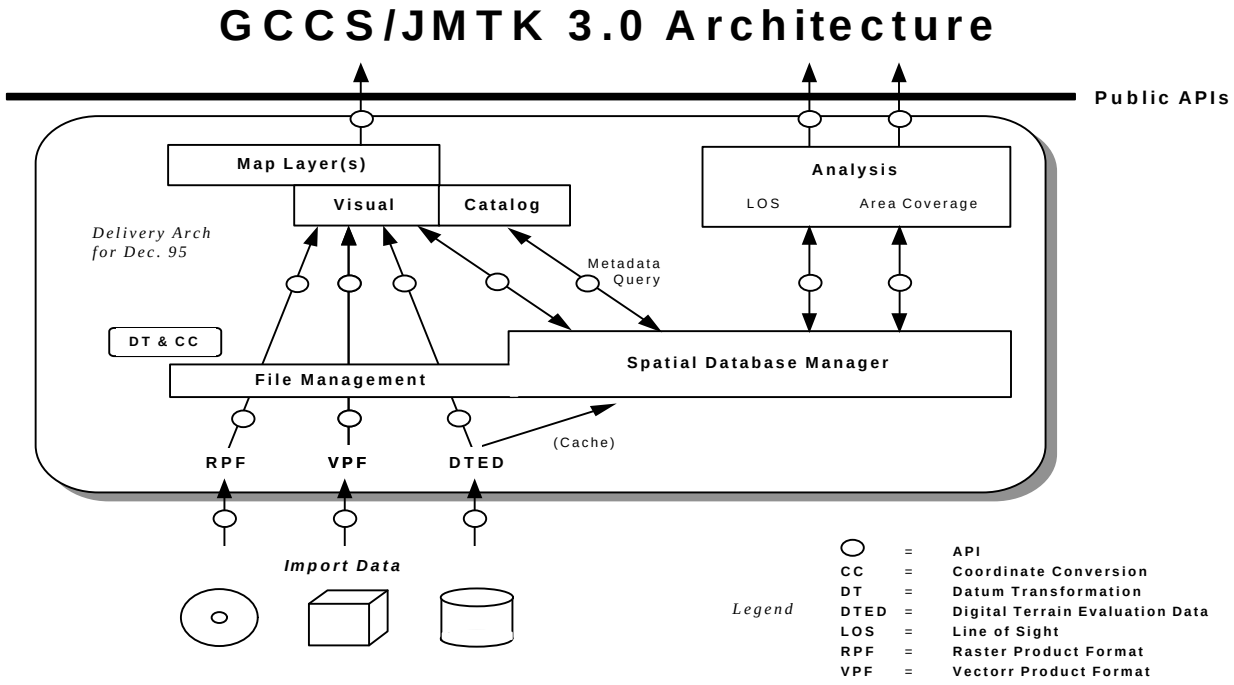

Figure 3. GCCS/JMTK Architecture 3.0

In subsequent releases, the GCCS/JMTK will migrate from a constrained approach dictated by its initial reliance on the software contributions of the individual services, to an independent architecture that is objective and in compliance with the DII COE. Figure 4 shows the proposed GCCS/JMTK Design for GCCS Release 4.0.

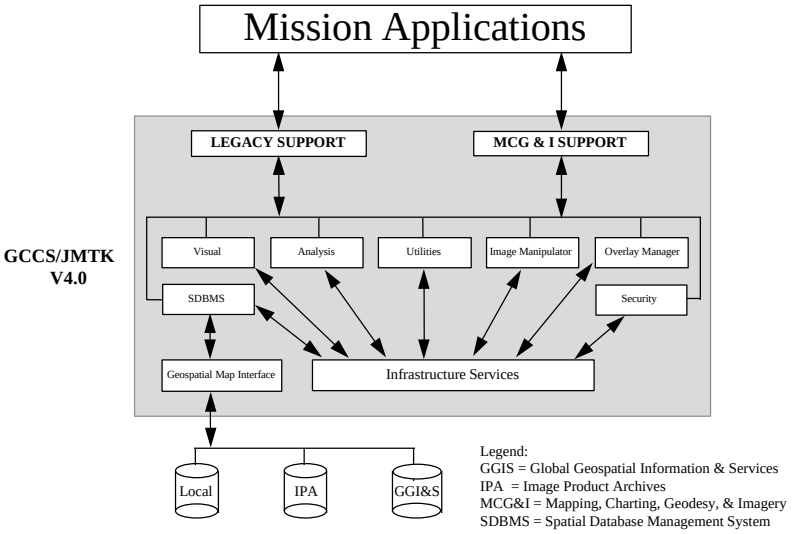

Figure 4. Proposed GCCS/JMTK Version 4.0 Architecture

GCCS/JMTK is an integration effort sponsored by the Defense Mapping Agency (DMA) to integrate existing Department of Defense (DoD) software into a tool kit which will meet the requirements of the GCCS COE. The GCCS/JMTK will provide standard mapping, charting, geodesy, and imagery data and exploitation capabilities as a functional area for the GCCS COE. The GCCS/JMTK architecture (Figure 5. Schematic of GCCS/JMTK, Version 3.0) consists of three blocks: Block 1 - visual (display of maps and overlays), Block 2 - analysis (e.g., terrain analysis, line of sight), and Block 3 - spatial database (of DMA products and other products produced by the military services as well as files generated by GCCS/JMTK). Interconnection of the three major components is through Application Programming Interfaces (APIs).

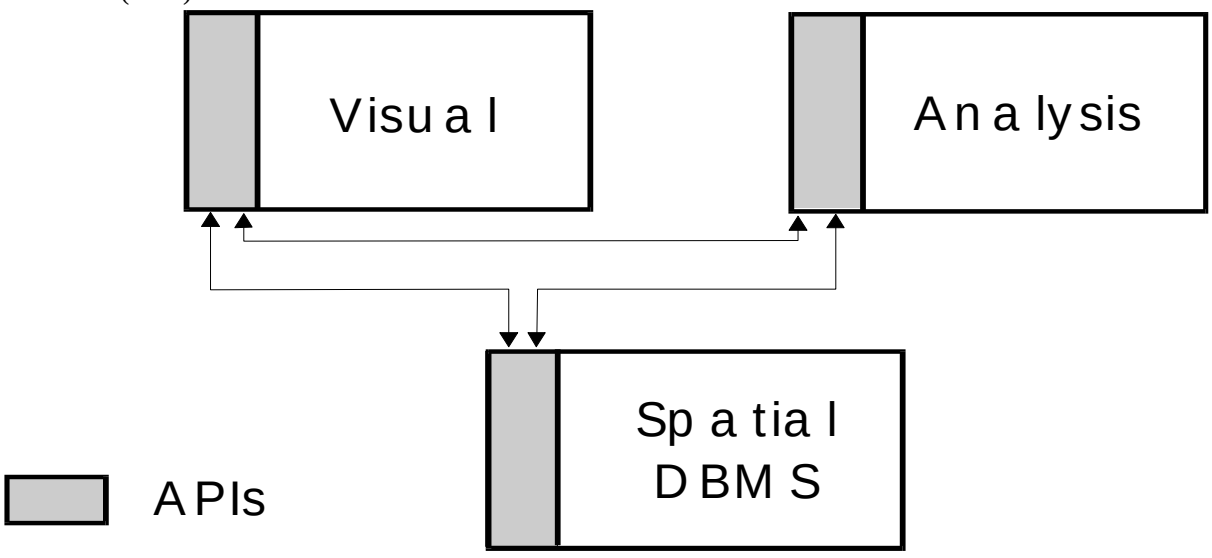

Figure 5. Schematic of GCCS/JMTK, Version 3.0

DMA's implementation strategy is primarily based upon evolutionary migration. The visual block will be taken from the Navy product - CHART; the analysis block will be taken from the Army product - Terrain Evaluation Model (TEM), and the spatial database will be taken from the Air Force product - Common Mapping Tool Kit (CMTK). Because each of the three military services has software products that perform identical functions, the GCCS approach is to use the best of each and integrate these components into GCCS/JMTK.

The GCCS/JMTK will ultimately be employed by users of GCCS. GCCS will become the single Command, Control, Communications, Computer, and Intelligence (C^4I) system to support the warfighter at the command post and eventually in the cockpit and in the foxhole. The GCCS will provide a single view for the joint warfighter. The view will be through a widely distributed, user driven network to which the warfighter "plugs-in".

1.2.4 Message Processing Services System Overview

This document includes the software requirements for the Global Command and Control System (GCCS) Common Operating Environment (COE) message processing functional area. The purpose of the message processing functional area is to provide message receipt, routing, storage, retrieval, parsing, generation, coordination, release and processing of standing request for information.

The message processing module is logically bounded on one side by the communications module and on the other side by supported processes and/or other COE modules. Processing of inbound messages from the communications front end includes such essential functions as validation, profiling, standing request for information, parsing, and routing. Processing of messages for hand off to the communications front end includes such essential functions as message preparation, validation, header preparation and coordination/release. The message processor is capable of processing both formatted and unformatted messages which are validated by tables derived from the Joint Interoperability Engineering Office (JIEO) Central Data Base System (CDBS). Message processor module components may be employed independently to perform a single or group of functions, such as construct message reports while another tool validates. Figure 6. Message Processing Module provides a top level functional flow of the message processing module and identifies three major subordinate areas within the processing module. Two of these areas are inbound and outbound processing which contain functionality specific to that process. The third is support services which contain functionality used by both inbound and outbound processing.

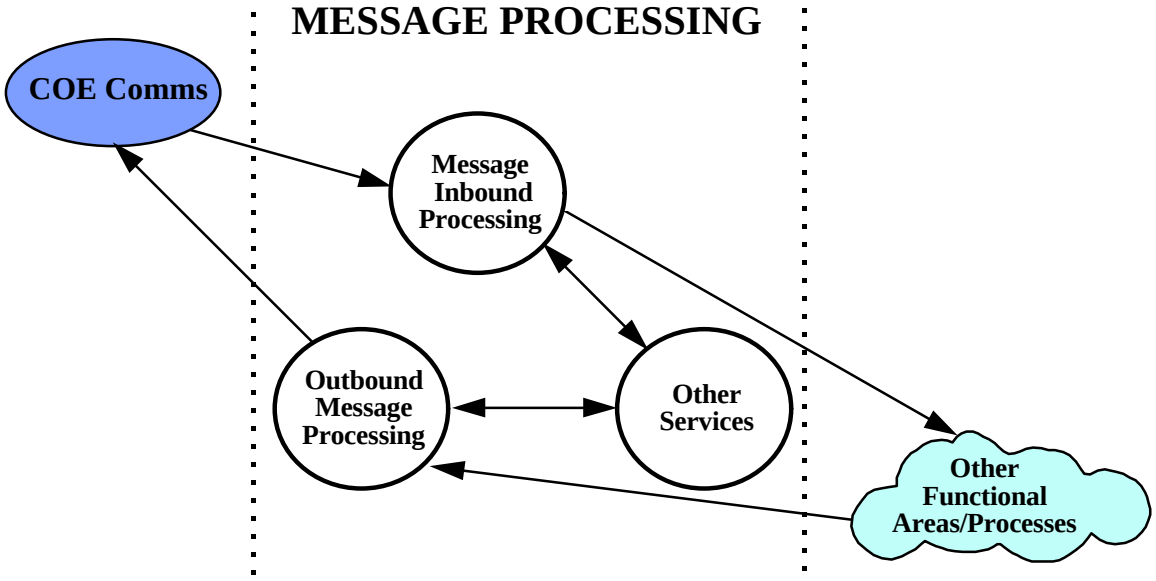

Figure 6. Message Processing Module

The message processing module provides for message receipt, from a communications front end; internal message routing; the generation, coordination and release of outbound messages; data normalization; storage and retrieval; message profiling; and format validation.

The message processing functional area consists of modularized and callable software that supports message parsing, message storage and retrieval, scanning of inbound messages for satisfaction of Standing Request for Information (SRI), internal routing of messages, message creation (automatically or interactively), data normalization, retrospective search, and error handling. It is a generic, table driven processor that accepts formatted and unformatted USMTF like messages from a communications front end, validates message format and field content, then performs additional processing as directed by the user. Figure 7. Message Processing Module Functional Flow Diagram provides a functional flow of the message processing module.

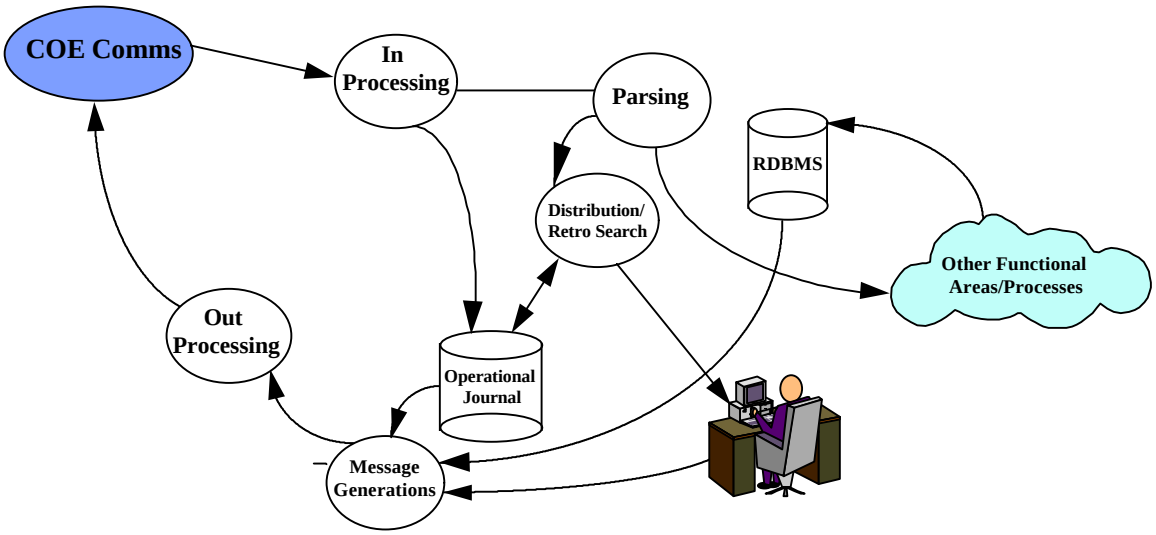

Figure 7. Message Processing Module Functional Flow Diagram

1.2.5 Office Automation Services System Overview

This document includes the Office Automation requirements for the Defense Information Infrastructure (DII). Dependencies and interactions between Office Automation and other functional areas of DII are discussed to help clarify where Office Automation begins and ends and how these services fit into the overall DII Common Operating Environment (COE).

The Office Automation (OA) requirements identify standards for interoperability and data interchange for the OA software packages. Emphasis is placed on the identification of standard data protocols and data formats, leaving users to select compliant, Word Processing, Spreadsheet and Briefing Graphics packages that best meet their needs. The goal is to establish applications that communicate through standard Application Programming Interfaces (APIs). The office automation requirements contained within this document shall be used throughout the other DII functional areas to perform similar functions.

Requirements in this document pertain to software developed for the DII, software developed by other programs which have been contributed to DII, and, where possible, to non-developmental software (Government-Off-The Shelf (GOTS) and Commercial-Off-The-Shelf (COTS)) which have been licensed for use within DII.

Office Automation is part of the DII COE. OA identifies standards for the DII OA software packages. The OA software packages will provide general automated productivity-enhancing applications. The office automation functional capabilities include: word processing, email, presentation

graphics, spreadsheet, drawing, illustration, and other office tools identified as necessary within the DII COE.

Word Processor applications support the writing, revising, manipulation, formatting, and printing of electronic documents, printed papers, printed reports, and other printed matter. Word Processor applications also support limited functions for document formatting, e.g., changes of font, line spacing, incorporation of graphics created with another application, or page layout.

Electronic Mail applications support the creation, sending, receiving, viewing, storing, and forwarding of digital information. The information may be text, video, sound, imagery, graphics, animation, multimedia or hypermedia. Capabilities such as forward, carbon copies, return request receipts, electronic signature authentication, and the ability to attach files are supported. Electronic Mail applications let users specify parameters for what information to discard or retain and how it should be stored. Electronic Mail messages should not be confused with the Message Processing System "formatted messages"; however, the two systems should be interoperable at the protocol level and be capable of exchanging data, e.g., messages and message attachments.

Presentation Graphics applications support the planning, writing, revising, manipulation, formatting, and printing of briefings. The slides for a briefing are treated by Presentation Graphics applications as a single entity and not as a separate file for each image. Presentation Graphics applications include business graphics and tools for limited drawing and painting tasks. Images and graphics created by other office automation applications may be inserted into the Presentation Graphics images.

Spreadsheet applications support the processing of information that is arranged in rectangular arrays. Spreadsheet applications use rows and columns of cells. Each cell can hold text or numerical data, or a formula that uses values in another cell to calculate a result. Spreadsheet applications also support the graphical display (e.g., scatter grams, two and three dimensional graphs) of the data contained in the spreadsheet.

Drawing and Illustration applications support the creation and manipulation of object-oriented graphics (e.g., lines, curves, and other geometric shapes). A user of Drawing applications can manipulate an element such as a line, circle, or block of text as an independent object by selecting the object and moving it.

1.2.6 On-Line Support Services System Overview

Due to the complexity of software, it is often unreasonable to assume users will be capable of learning the operation of an entire package. To resolve this issue within the GCCS COE, On-Line Support must be made available to aid operators of the system. The On-Line Support functional area will serve as the main vehicle to provide all users with the necessary assistance in all aspects of system operation. Four basic support services are required to achieve comprehensive coverage of system operation: On-Line Help, On-Line Job Planning, On-Line Reference, and Computer Based Instruction (CBI).

The On-Line Help service is intended to provide quick reference help as needed by the user. It is a service available to users for purposes of completing a particular task which does not involve complex procedures.

The second service, Job Planning, is intended to assist users in identifying and understanding the processes involved in simple or complex task execution. This can be presented to the user in the form of flow charts illustrating step-by-step procedures complemented by detailed text descriptions of the events shown in the diagram.

On-Line Reference offers the user the ability to browse electronic versions of operator and system manuals to allow for a deeper understanding of the system should he/she feel the need or desire.

Finally, the purpose of CBI is to offer structured lessons or tutorials. CBI could, in theory, instruct the user in almost any subject matter, potentially circumventing accredited instruction programs at Navy Schools. Such problems, while significant, may be solved by establishing preventive procedures. This document does not define the subject matter of CBI; its purpose is to define CBI capabilities within the GCCS COE, without regard to content of the instruction.

1.3 Document Overview

Section 2 lists documents referenced and documents that provide guidance applicable to this specification.

Section 3 details the requirements for each of the DII COE common support application services: Alerts Services, Track Correlation Management Services, Joint Mapping Tool Kit (JMTK) Services, Message Processing Services, Office Automation Services, and On-Line Support Services.

Section 4 identifies the qualification provisions including the methods used to ensure that the requirements in Section 3 have been met.

Section 5 addresses the traceability of each requirement from an appropriate source, such as a requirements document; Section 5 also includes implementation priorities for each requirement.

Section 6 contains acronyms, abbreviations, schedules, and a list of terms and definitions needed to understand this document

CHAPTER 2. Applicable Documents

This section provides references to applicable documents that describe requirements, specifications and functional capabilities for DII COE common support application services: Alert Services, Correlation Services, Joint Mapping Tool Kit (JMTK) Services, Message Processing Services, Office Automation Services, and On-Line Support Services.

The following documents form a part of this specification to the extent specified herein. In the event of a conflict between the documents referenced herein and the contents of this specification, the contents of this specification shall be considered a superseding requirement. Latest versions of documents are applicable where exact dates are not provided.

Copies of specifications, standards, drawings, and publications required by suppliers in connection with specified procurement functions should be obtained from the contracting agency or as directed by the contracting officer.

2.1 Government Documents

2.1.1 Alert Services

2.1.1.1 Alert Services Specifications

- ACCS-A1-100-006: System Specification for Army Tactical Command and Control System (ATCCS)
- ATCCS-A1-302-001A: Army Tactical Command and Control System Common ATCCS Support Software (CASS) Systems/Segment Specification
- LL-500-04-03: GCCS Common Operating Environment Baseline, DISA, Nov 1994
- XXXXX: AWIS Software Requirements Specification (ASRD), July 1992

2.1.1.2 Alert Services Standards

- MIL-STD-498: Military Standard - Software Development and Documentation, DoD, Dec 1994
- DoD-STD-1815A: Ada Programming Language, January 1983
- DoD-STD-2168: Defense System Software Quality Program Standards, DoD, Apr 1988

2.1.2 Track Correlation Management Services

- Battle Group Database Management Software Requirements Specification (BGDBM), SPAWAR-B-832, Revision A, Specification Change Notice 1, 1 March 1995.
- MIL-STD-498, DI-IPSC-81433, Data Item Description for Software Requirements Specification, 5 December 1994.
- JDL Data Fusion Model.
- Track Correlation Management Services Functional Description Document (FDD), 17 July, 1996.
- Defense Information Infrastructure (DII) Common Operating Environment (COE) Integration & Runtime Specification (I&RTS) , Joint Interoperability and Engineering Organization, Defense Information Systems Agency (DISA).
- DII COE Baseline Document, v1.0, Joint Interoperability and Engineering Organization, DISA, 20 Feb 1996.
- ORDs

2.1.3 Joint Mapping Tool Kit (JMTK) Services

- Defense Information Systems Agency. Defense Information Infrastructure (DII) Common Operating Environment (COE) Baseline. Version 1.0. PRELIMINARY DRAFT. 14 February 1996.
- Defense Information Systems Agency. User Interface Specifications for the Defense Information Infrastructure (DII), Version 2.0, PRELIMINARY DRAFT, 1 December 1995.
- Institute for Defense Analyses. Architecture Design Document for the Global Command and Control System (GCCS) Common Operating Environment (COE), DRAFT, 15 December 1995.
- Defense Information Systems Agency. Defense Information Infrastructure (DII) Common Operating Environment (COE) Integration and Runtime Specification (I&RTS), Version 2.0, PRELIMINARY, 23 October 1995.
- Defense Information Systems Agency. Global Command and Control System (GCCS) Common Operating Environment (COE) Baseline, 28 November 1994.
- Defense Mapping Agency. GCCS/JMTK Application Programming Interfaces (APIs) for GCCS Version 2.0, 24 October 1995.

2.1.4 Message Processing Services

2.1.4.1 Specifications

- MROC 9-81: JCS Multi-Command Required Operational Capability (MROC) for Automated Message Handling, May 1981, Updated July 1983.

2.1.4.2 Standards

- MIL STD 6040 (Interim), U.S. Message Text Formatting Program, Description of U.S. Message Text Formatting Program
- ACCS-A3-500-004 Army Command and Control System Message Catalog, 28 May 1993.
- ACCS-A3-500-005 Message Format Definition Database Specification.
- Joint Variable Message Format (VMF) Technical Interface Design Plan.
- Intelligence and Electronic Warfare (IEW) Character-Oriented Message Catalog (COMCAT)
- United States Signals Intelligence Directive (USSID) 316
- Marine Tactical System (MTS), Marine Corps Unique Message Standard
- OTH-GOLD, Navy Unique Message Standard
- ADatP-3, Allied Data Publication

2.1.4.3 Other Government Documents

- DSSCS Operating Instructions (DOI) 103
- Allied Communications Publication (ACP) 126: GENSER Operating Procedures.
- Allied Communications Publication (ACP) 126(M): GENSER Operating Procedures (Modified).
- Allied Communications Publication (ACP) 127: NATO Operating Procedures.
- DD173: Joint Message Form, January 1979.
- MIL STD 1832: Diskette Message File Formats for Defense Messaging, 6 Sep 93 with latest change pages.
- Allied Communications Publication (ACP) 123.
- Allied Communications Publication (ACP) 127(M): NATO Operating Procedures (Modified).
- MIL STD 2045-47001, Application Layer Protocol
- User Interface Specifications for the Global Command and Control System (GCCS)
- Defense Intelligence Agency Manual (DIAM) 65-19
- Army Regulation (AR) 380-19, Information Systems Security

- Department of Defense (DoD) Standard 5200.28, Department of Defense Trusted Computer System Evaluation Criteria
- Joint Chiefs of Staff (JCS) Publication 6-03.7
- Joint Army, Navy, and Air Force Protocol (JANAP) 128

2.1.5 Office Automation Services

- Defense Information Infrastructure (DII) Common Operating Environment (COE) Functional Area System Requirements Specification for Message Processing, 11 July 1995, DISA
- User Interface Specifications for the Defense Information Infrastructure (DII), Version 2.0, 31 December, 1995, DISA
- Defense Information Infrastructure (DII) Common Operating Environment (COE) Baseline, Version 1.0, Preliminary Draft, February 14, 1996, DISA.
- Defense Information Infrastructure (DII) Common Operating Environment (COE) Integration and Runtime Specification (I&RTS) , Version 2, October 23, 1995, DISA.
- Defense Information Infrastructure (DII) Common Operating Environment COE Security Requirements Specification, Version 1.2, 1 December, 1995
- DOD, MIL-STD-1781, May 1984, Simple Mail Transfer Protocol (SMTP), Washington, DC: DOD.
- NIST, FIPS PUB 128-1, 11 May 1993, Computer Graphics Metafile (CGM),Springfield, VA: NTIS.
- NIST, FIPS PUB 152, September 1988, Standard Generalized Markup Language(SGML), Springfield, VA: NTIS.

2.1.6 On-Line Support Services

- Software Requirements Specification (SRS) Data Item Description, Identification Number DI-IPSC-81433, 5 December 1994
- Joint Maritime Command Information System (JMCIS) Common Operating Environment (COE) Version 1.3, February 1994
- Multilevel Security in the Department of Defense: The Basics, March 1, 1995
- Global Command and Control System (GCCS) Integration Standard, Version 1.0, October 1994.
- Global Command and Control System (GCCS) Common Operating Environment Baseline, DISA, November 28, 1994.
- User Interface Specifications for Global Command and Control System (GCCS), Version 1.0, October 1994.
- Draft Architectural Design Document for the Global Command and Control System (GCCS) Common Operating Environment (COE), Version 3, July 24, 1994.
- Draft GCCS COE Data Access Services Software Requirements Specifications, Version 3.0, September 29, 1995

2.2 Non-Government Documents

2.2.1 Alert Services

- IEEE 1003.1: Standard Portable Operating Interface for Computer Environments (POSIX), IEEE, September 1988
- ISBN 0-937175-11-0: Xlib Programming Manual, Vol. 1, 2nd Ed., O'Reilly and Assoc. [Adrian Nye], Sebastopol, CA, 1990
- ISBN 0-937175-12-9: Xlib Programming Manual, Vol. 2, 2nd Ed., O'Reilly and Assoc. [Adrian Nye], Sebastopol, CA, 1990
- ISBN 0-937175-33-1: X Toolkit Intrinsics Programming Manual, O'Reilly and Assoc. [Adrian Nye and Tim O'Reilly], Sebastopol, CA, 1990

- ISBN 1-56592-005-8: Understanding DCE, O'Reilly and Assoc. [Ward Rosenberry, David Kenney and Gerry Fisher], Sebastopol, CA, 1993
- ISBN 1-56592-005-8: Guide to Writing DCE Applications, O'Reilly and Assoc. [John Shirley], Sebastopol, CA, 1992

2.2.2 Track Correlation Management Services

2.2.3 Joint Mapping Tool Kit (JMTK) Services

- Joint Mapping Toolkit Working Group. Software Engineering Standards for GCCS Joint Mapping Toolkit, Version 3.0, 30 April 1996.
- Computer Sciences Corporation. 3.0 JMTK Software Test Plan, 15 December 1995.
- Computer Sciences Corporation. 4.0 JMTK Software Interoperability Document, DRAFT, 17 April 1996.
- Computer Sciences Corporation. Functional Requirements for the Joint Mapping Tool Kit (GCCS/JMTK) of the Global Command and Control System (GCCS) Common Operating Environment (COE), Version 1, 20 July 1995.
- Computer Sciences Corporation. DRAFT Software Requirements Specification for the Joint Mapping Tool Kit (GCCS/JMTK) of the Global Command and Control System (GCCS) Common Operating Environment (COE), Release 1.0, DRAFT, 9 October 1995.

2.2.4 Message Processing Services

2.2.5 Office Automation Services

- Adobe Systems Inc., 1990, PostScript Language Reference Manual, 2nd ed., Reading, MA: Addison-Wesley.
- CCITT X.400-X.430, November 1988, Message Handling Systems, Vol. VIII-FascicleVIII.7-CCITT Recommendation, Switzerland: CCITT.
- IEEE P1003.1, 1990, IEEE Standard Portable Operating System Interface for Computer Environments, Piscataway, NJ: IEEE.
- ISO 8879, 1986, Information processing — Text and office systems— Standard Generalized Markup Language (SGML), Switzerland: ISO.
- X/Open Single UNIX Specification, 1995, San Francisco, CA: X/Open Co.,Ltd.
- X/Open Common Desktop Environment (CDE) Specification, 1995, , San Francisco, CA: X/Open Co., Ltd..
- ECMA Application Programming Interface for Windows (APIW) Specification (Draft), 14 July, 1995, ECMA

2.2.6 On-Line Support Services

CHAPTER 3. Requirements

3.1 Required States and Modes

The DII operates in the following modes:

- Operational Mode. This is the normal mode of operation where the DII is on-line supporting the operational mission.
- Maintenance Mode. In this mode, portions of the hardware or software at the DII site will be off-line for maintenance, modification, upgrade, or other related action.
- Training Mode. In this mode, a portion of the DII may be operated with separate databases using simulated inputs in support of training for a portion of the user population. Care must be taken to ensure that exercise data is not mixed with operational data.
- Exercise Mode. In this mode, a portion of the DII may be operated with separate databases using simulated inputs in support of an exercise for a portion of the user population.

Care must be taken to ensure that exercise data is not mixed with operational data.

Normal day-to-day operations will probably find all three operating modes existing at the same time at different DII sites. The modes will be distinguished by administrative features or architectural boundaries.

3.1.1 Alert Services

The Alert Services is not a stand-alone subsystem. Alert Services provides generic C2 support services and is designed to be embedded into an end-user's system. The Alert Services has no operating modes or states of its own.

3.1.2 Track Correlation Management Services

3.1.3 Joint Mapping Tool Kit (JMTK) Services

3.1.4 Message Processing Services

The message processing module shall:

3.1.4.1 Support all defined GCCS states.

Traceability:
Priority ???

3.1.4.2 Support all defined GCCS modes.

Traceability:
Priority ???

3.1.5 Office Automation Services

The Office Automation requirements are valid for all required states and modes.

3.1.6 On-Line Support Services

OL 3.1.1 The On-Line Support services shall operate in two modes when providing demos: Passive demo, and Active demo. Passive demo mode is analogous to Read Only Memory where the user only reads or observes the illustrated process whereas Active demo mode allows the user to participate in the demo.

Traceability:
Priority 1

3.2 Functional Requirements

The following sections describe the functional requirements for: Alert Services, Track Correlation Management Services, Joint Mapping Took Kit (JMTK) Services, Message Processing Services, Office Automation Services, and On-Line Support Services

AS 3.2 Alert Services Functional Requirements

The sub-paragraphs in this section establish the functional requirements for the Alert Services functional area. It is intended that the requirements in paragraph AS 3.2.1 represent the basic capabilities of an Alerts "Server" and those in paragraph AS 3.2.2 represent the basic capabilities of an "Alerts Display Tool". To avoid constraining the software designers unduly, there has been no attempt to allocate Alert Services requirements to implementation objects.

AS 3.2.1 Alert Services Management Requirements

3.2.1.1 Alert Services shall provide the capability to initiate alerts according to criteria selected by the application program issuing the alert.

Traceability: SS 3.2.14.1
Priority ???

3.2.1.2 Alert Services shall provide the capability to initiate the display descriptive text and/or operator dialog forms with a visual alert.

Traceability: SS 3.2.14.2
Priority ???

3.2.1.3 Alert Services shall provide the capability to deliver selected alerts to the processes that have registered to receive them.

Traceability: SS 3.2.14.3
Priority ???

3.2.1.4 Alert Services shall provide the capability to deliver the operator inputs in response to displayed alerts to the processes that initiated them.

Traceability: SS 3.2.14.4
Priority ???

3.2.1.5 Upon receipt of requested data originating from an application, Alert Services shall provide the capability to deliver the data to the alert initiator.

Traceability: SS 3.2.14.5
Priority ???

3.2.1.6 Alert Services shall provide the capability to queue pending alerts, arranged by alert precedence, until they are recalled for display and handling.

Traceability: SS 3.2.14.6
Priority ???

3.2.1.7 Alert Services shall provide the capability to queue pending alerts as long as the registrations of the receiving applications remain valid.
Traceability: SS 3.2.14.7
Priority ???

3.2.1.8 Alert Services shall provide the capability to suspend alert processing.
Traceability: SS 3.2.14.8
Priority ???

3.2.1.9 Alert Services shall provide the capability to resume alert processing.
Traceability: SS 3.2.14.9
Priority ???

3.2.1.10 Alert Services shall provide the capability to deliver for display alerts from the alert queues IAW alert priorities and the times that the alerts were issued.
Traceability: SS 3.2.14.10
Priority ???

3.2.1.11 Alert Services shall provide the capability to deliver for display individual alerts on a workstation IAW the classification of the alert and the classifications of the logged on user and workstation.
Traceability: SS 3.2.14.11
Priority ???

3.2.1.12 Alert Services shall provide the capability to delete an existing alert and/or its associated text from a display.
Traceability: SS 3.2.14.12
Priority ???

3.2.1.13 Alert Services shall provide the capability to print alerts from the alert queues IAW alert priorities and the times that the alerts were issued.
Traceability: SS 3.2.14.13
Priority ???

3.2.1.14 Alert Services shall provide the capability to print individual alerts on workstation IAW the classification of the alert and the classifications of the logged on user and workstation.
Traceability: SS 3.2.14.14
Priority ???

3.2.1.15 Alert Services shall provide the capability to disable all alerts, except for those alerts related to incoming Flash messages, system shutdowns, and loss of communications connectivity.
Traceability: SS 3.2.14.15
Priority ???

3.2.1.16 Alert Services shall provide the capability to view Alert activity via a human-readable log report.
Traceability:
Priority ???

3.2.1.17 Alert Services shall provide the capability to fail-over all Alert activities through the use of multiple servers.
Traceability:
Priority ???

3.2.1.18 Alert Services shall provide the capability to create a standard Alerts database containing predefined Alerts.
Traceability:
Priority ???

3.2.1.19 Alert Services shall provide the capability to maintain a standard Alerts database.
Traceability:
Priority ???

3.2.1.20 Alert Services shall provide the capability to access a standard Alerts database.
Traceability:
Priority ???

3.2.1.21 Alert Services shall provide the capability to delete a standard Alerts database.
Traceability:
Priority ???

3.2.1.22 Alert Services shall provide the capability to indicate when to highlight alert priority through visual cues:

- Blinking/Stationary
  Traceability: SS 3.2.14.16
  Priority ???
- Intensity
  Traceability: SS 3.2.14.16
  Priority ???
- Color.
  Traceability: SS 3.2.14.16
  Priority ???

3.2.1.23 Alert Services shall provide the capability to indicate when to disable an application from making an entry in any display window but an alert window until the alert window is closed.
Traceability: SS 3.2.14.18
Priority ???

3.2.1.24 Alert Services shall provide the capability to notify an application when specified alerts are initiated.
Traceability: SS 3.2.14.19
Priority ???

AS 3.2.2 Alerts Display Service Requirements

3.2.2.1 Alert Services shall provide the capability for an operator to enable Alerts processing through window entries.
Traceability:
Priority ???

3.2.2.2 Alert Services shall provide the capability for an operator to disable Alerts processing through window entries.
Traceability:
Priority ???

3.2.2.3 Alert Services shall provide the capability for an operator to display the total number of pending Alerts.
Traceability:
Priority ???

3.2.2.4 Alert Services shall provide the capability for an operator to display the total number of pending Interactive Alerts.
Traceability:
Priority ???

3.2.2.5 Alert Services shall provide the capability for an operator to display the total number of pending Critical Priority Alerts.

Traceability:
Priority ???

3.2.2.6 Alert Services shall provide the capability for an operator to display all pending Alerts.

Traceability:
Priority ???

3.2.2.7 Alert Services shall provide the capability for an operator to display selected pending Alerts.

Traceability:
Priority ???

3.2.2.8 Alert Services shall provide the capability for an operator to display the full text of selected pending Alerts.

Traceability:
Priority ???

3.2.2.9 Alert Services shall display the Alert Name, Classification, Originator, Priority, and Time for each selected pending Alert (in both the summary and full-text displays).

Traceability:
Priority ???

3.2.2.10 Alert Services shall provide the capability for an operator to display selected pending Alerts filtered by originator, priority or classification.

Traceability:
Priority ???

3.2.2.11 Alert Services shall provide the capability for an operator to display selected pending Alerts sorted according to key fields.

Traceability:
Priority ???

3.2.2.12 Alert Services shall provide the capability for an operator to sort displayed Alerts according to alert priority.

Traceability:
Priority ???

3.2.2.13 Alert Services shall provide the capability for an operator to sort displayed Alerts according to alert originator.

Traceability:
Priority ???

3.2.2.14 Alert Services shall provide the capability for an operator to sort displayed Alerts in time-forward or time-reverse order.

Traceability:
Priority ???

3.2.2.15 Alert Services shall provide the capability for an operator to print all pending Alerts.

Traceability:
Priority ???

3.2.2.16 Alert Services shall provide the capability for an operator to print selected pending Alerts.

Traceability:
Priority ???

3.2.2.17 Alert Services shall provide the capability for an operator to print selected pending Alerts filtered by originator, priority or classification.

Traceability:
Priority ???

3.2.2.18 Alert Services shall provide the capability for an operator to print selected pending Alerts sorted according to key fields.

Traceability:
Priority ???

3.2.2.19 Alert Services shall provide the capability for an operator to sort printed Alerts according to alert priority.

Traceability:
Priority ???

3.2.2.20 Alert Services shall provide the capability for an operator to sort printed Alerts according to alert originator.

Traceability:
Priority ???

3.2.2.21 Alert Services shall provide the capability for an operator to sort printed Alerts in time-forward or time-reverse order.

Traceability:
Priority ???

3.2.2.22 Alert Services shall provide the capability for an operator to delete selected pending Alerts.

Traceability:
Priority ???

3.2.2.23 Alert Services shall provide the capability for an operator to acknowledge selected pending Alerts (without deleting them from the queue).

Traceability:
Priority ???

3.2.2.24 Alert Services shall provide the capability for an operator to purge all Alerts in the pending Alerts queue.

Traceability:
Priority ???

3.2.2.25 Alert Services shall provide the capability for an operator to purge those Alerts in the queue that were issued prior to an operator-specified time.

Traceability:
Priority ???

AS 3.2.3Requirements Submitted by the Army

3.2.3.1 Alert Services display and print alert information. Text displays, audio alerts, and visual alerts can be issued in any combination for a given alert condition. Alert processing may be suspended, and resumed, under the control of an application program. Alert priority may be highlighted.

3.2.3.1.1 Alerts Services shall provide the capability to report BFA specified errors to applications for handling.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.3.2 Error Handling.

3.2.3.2.1 Alerts Services shall provide the capability to monitor the detection of software errors.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.3.2.2 Alerts Services shall provide the capability to activate the error handler upon detection of any software error reported.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.3.2.3 The System Error Handler shall select from pre-specified criteria what caused the error.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.3.2.4 Alerts Services shall provide the capability to notify the Officer In Charge / Non-Commissioned Officer In Charge (OIC/NCOIC) upon detection of any software error along with a detailed description of the error in human readable form.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.3.2.5 Alerts Services shall provide the capability to return status parameters within a call for reporting standard error conditions.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.3.2.6 Alerts Services shall provide the Office In Charge / Non-Commissioned Officer In Charge (OIC/NCIOC) the capability to control:

3.2.3.2.6.1 Acknowledgment of alarms alerts from the analyst appliation software, such as CIP/IMP.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.3.2.6.2 Notification of unacknowledged alarms/alerts.

Traceability: ARMY, 20 July 1996
Priority ???

CO 3.2 Track Correlation Management Services Functional Requirements

Track Correlation Management Services (TCMS) functional requirements are focused on two goals: integrating contact data based upon discrete and continuous attribute information to create and maintain a valid and timely track database (Tdb), and support management of a common operational picture based on an allocation of data management responsibilities to organizations across a theater of operations. This section defines the system requirements to achieve both goals.

Note that the Track Correlation Management Services (or System) is referred to simply as "system" in the following requirements.

CO 3.2.1 Data Representation Functional Requirements

3.2.1.1 The Tdb **shall** contain both contact and track data. This track and contact data **shall** be accessible in terms of related entities (e.g., aircraft, ships, land force units) and in terms of technical collection domains (e.g. ELINT, COMINT, ...). The Tdb will also contain associations between tracks and entities. (The mechanisms and internal data structures for implementation are not dictated in this SRS, nor are the number of contacts or tracks to be allocated.)

Traceability:
Priority ???

3.2.1.2 The system **shall** be capable of maintaining integrity of tracks within technical collection domains.

Traceability:
Priority ???

3.2.1.3 Identifying attributes and related information maintained for each of the Tdb tracks **shall** be based on that information needed to support the correlation processing requirements and to support display requirements, i.e. display symbol identification, location, and annotation.

Traceability:
Priority ???

3.2.1.4 The TDB **shall** support representation of unit echelon and type (i.e. armored cavalry), and support association of units to represent aggregation into higher echelon forces.

Traceability:
Priority ???

3.2.1.5 Aggregated force representations **shall** include representation of the center of mass of the force and command post locations when known.

Traceability:
Priority ???

3.2.1.6 Associations between entities and tracks are intended to represent the results of a data fusion process and analysis. Associations, once established, **shall** also be capable of being broken (disassociated) in the event that contravening information becomes available.

Traceability:
Priority ???

3.2.1.7 The Tdb **shall** support the control of the visibility of each track across a LAN or WAN (referred to in this SRS as scope). A given track may be visible only at a given workstation on a LAN (terminal tracks), at all workstations on a local area network (local tracks), or be a candidate for transmission on a WAN (WAN tracks). The system **shall** support the assignment of track scope, and a mechanism for manually modifying the scope of a given track.

Traceability:
Priority ???

3.2.1.8 The Tdb **shall** support the designation of each record as either real world, live training (occurs when a friendly unit simulates a different object during a training exercise), and simulated (contact reports that are artificially injected into the system). Live training tracks **shall** be promotable to real world (with the required attribute changes) at the end of a training exercise.

Traceability:
Priority ???

3.2.1.9 The Tdb **shall** contain the most current attribute information for each track together with additional fields related to the track. The Tdb **shall** store all reports into the track's report history, but the track's report history may be limited to the most recent report events if required for disk management.

Traceability:
Priority ???

The size of archived track history may vary according to track characteristics. For example, there may be no requirement to archive unidentified TADIL track histories owing to the real time nature of the data source.

3.2.1.10 The Tdb **shall** support a scaleable, distributed environment across a LAN/WAN, be capable of maintaining a master Tdb for the network, and provide access to Tdb information across the LAN/WAN.

Traceability:
Priority ???

3.2.1.11 The system **shall** support the assignment to each track object of a unique identification (UID) key field that is guaranteed to be unique across the worldwide DII.

Traceability:
Priority ???

CO 3.2.2 Correlation Service

The system **shall** provide the capability to automatically correlate incoming reports to existing tracks, originate new tracks when necessary, or originate ambiguities if correlation leads to anomaly. At a minimum, the system provides two types of correlation processing:

Traceability:
Priority ???

- Attribute correlation, wherein correlation decisions are based primarily on matching data fields with discrete valid values.

  Traceability:
  Priority ???

- Statistical correlation, which is applied in case the contact report contains useful continuous parameters characteristic of the entity being observed, but which contains insufficient discrete attributes for successful attribute matching.

  Traceability:
  Priority ???

This section specifies requirements for each type of processing, and how they should interact. It is organized along a model of data flow throughout the system with subsections devoted to data input and storage, data alignment, database update, correlation decision making, and data merging.

CO 3.2.2.1 Data Input Interface and Storage

3.2.2.1.1 This system **shall** provide common APIs to accept contact data from other COE segments such as the Communications Services and Mission Applications.

Traceability:
Priority ???

3.2.2.1.2 The system **shall** support the encoding and decoding of high volume binary data streams to include TADIL A, B, J, and other high data rate inputs. This requirement is necessary to achieve the required throughput.

Traceability:
Priority ???

3.2.2.1.3 The system **shall** support the back-up and restoration of track histories by archiving track information. This capability **shall** provide track information during disk failure and system upgrades. The system **shall** preserve the data event by event. A batch update may result in data loss during system failure. The system **shall** down-sample high data rate inputs to ensure viable storage volumes.

Traceability:
Priority ???

CO 3.2.2.2 Data Alignment

3.2.2.2.1 The system **shall** screen incoming contact reports for duplicate reporting and delete all contacts found to be an exact match to a previous report based upon attributes specified in a contact duplication table. (Note that this action could also occur at any time before the Tdb is updated and is not specified to occur in the data alignment phase.) Duplicate screening shall account for differences in reported precision, retaining the most precise information when duplicates are detected.

Traceability:
Priority ???

3.2.2.2.2 The system **shall** validate and normalize incoming data and prioritize for subsequent processing.

Traceability:
Priority ???

3.2.2.2.3 Data normalization **shall** include renormalizing error ellipse to a standard confidence factor, and synonym aliasing where appropriate.

Traceability:
Priority ???

3.2.2.2.4 The system **shall** provide a data filtering capability on input based on operator specified criterion to either explicitly include or exclude contact reports from being further processed. The criterion **shall** include geographic location, timeliness, and other information (which may be collection domain specific) that is either explicitly reported in the incoming contact report information or implicit based on the reported information.

Traceability:
Priority ???

CO 3.2.2.3 Distributed Data Management Functional Requirements

3.2.2.3.1 To support a Common Operational Picture (COP), the system **shall** support an allocation of data management responsibility by supporting the following modes of operation:

Traceability:
Priority ???

- Coordinator Mode - wherein a network node has been designated the responsible producer for compiling and maintaining a portion of the overall track database (e.g., based on geographic area, category, threat, track type) and reporting it in the form of track management directives both up echelon and to subordinate units.

  Traceability:
  Priority ???

- Participant Mode - wherein it can accept the received track management directives of a coordinator to faithfully replicate the portion of the overall tactical picture.

  Traceability:
  Priority ???

- Independent Mode - wherein all necessary processing is performed at that system installation, without any received track management directives from any other processes.

  Traceability:
  Priority ???

This capability permits the system to function across a wide area network (WAN) as a participant in multiple coordinator's networks simultaneously, with the objective of integrating components of the overall consistent track database reported by those coordinators in accordance with the allocation of track management responsibilities (e.g., allocation of maintenance of the air, ground, and maritime components of the overall track database to the appropriate components, and / or, further allocating track management responsibilities based on geographic regions or other means). It follows that the system must be configurable to recognize authoritative external track management directives.

3.2.2.3.2 The system **shall** include the capability to allow the coordinator to issue track management directives which add, remove, and modify information in a participant's track database (e.g., change a previously reported identity from "Unit XYZ" to "Unknown" or a null / no statement value).

Traceability:
Priority ???

3.2.2.3.3 The system **shall** be capable of respecting track management directives from locally installed integrated mission applications which inject track data into the system (e.g., via standard APIs). Thus, a mission application can function as a virtual track coordinator for a designated subset of the track database.

Traceability:
Priority ???

3.2.2.3.4 In either the coordinator, participant, or multiple participant modes of operation described above, the system **shall** also be capable of integrating additional source data into the track database based on local information sources and injecting it in a manner consistent with the operating mode. (Note that the operating modes described above are not mutually exclusive. For example, the system may serve as a coordinator for a portion of the track database, while simultaneously functioning as a participant to multiple other coordinators to obtain their contributions to the overall theater tactical picture, as well as maintaining an independent view of selected portions of the track database.)

Traceability:
Priority ???

CO 3.2.2.4 Correlation Processing

3.2.2.4.1 The system **shall** support routing of incoming data to the appropriate correlation processes. These processes **shall** include (but are not restricted to): discrete attributes, ELINT, COMINT, ACINT, GMTI, and others. The system **shall** be capable of directly updating the Track DB based upon received track management directives (e.g., receive track number, delete track, merge track), as well as maintaining an independent view of the data regardless of the system's operating mode (i.e., coordinator, participant, independent).

Traceability:
Priority ???

3.2.2.4.2 Whenever an incoming contact report contains data applicable to multiple correlation processes, the report **shall** be processed by each process. Decision rules **shall** be provided to resolve conflicts in the outcome of these multiple correlation processes. For example, a report that contains both unique attribute information and emitter parametric data **shall** be processed by both the attribute correlator and the ELINT correlator.

Traceability:
Priority ???

3.2.2.4.3 Attribute track correlation **shall** include feasibility checks, to include motion feasibility checks for moving targets and geographic tests for fixed targets. Feasibility tests **shall** include screening based upon category (land, naval, air, sub, etc.) and threat (friend, hostile, unknown, etc.) with a specified set of allowed and disallowed transitions.

Traceability:
Priority ???

3.2.2.4.4 Attribute matching **shall** be performed on a hierarchical basis to provide more reliance on higher confidence attributes and track continuity indicators, and inhibit inconsistencies in lower confidence attributes from preventing correlation in the presence of matching higher confidence information.

Traceability:
Priority ???

3.2.2.4.5 When updating Tdb objects based on correlation results, attribute information **shall** normally be treated as additive, with reported information being added to an object if not previously available but not over writing previously reported values so as to avoid allowing inconsistent reporting sources to incorrectly alter values in the Tdb. The exception to this additive update approach **shall** be the case of operating in participant mode wherein all updates from a

coordinator will be treated on an over write basis, faithfully representing the coordinator's management of the subset of the overall tactical picture allocated to it.

Traceability:
Priority ???

3.2.2.4.6 Previously declared ambiguities **shall** be reprocessed on a periodic or event basis to attempt resolution.

Traceability:
Priority ???

3.2.2.4.7 Tdb management processing **shall** be configurable to automatically purge unassociated track objects based on specified auto purge criterion.

Traceability:
Priority ???

3.2.2.4.8 The system **shall** support the ability to associate tracks in the Tdb with entities within the Modernized Intelligence Database (MIDB). Processing of contacts **shall** be able to consider MIDB entities in the candidate selection process, where appropriate (such as SIGINT reporting).

Traceability:
Priority ???

3.2.2.4.9 The system **shall** not permit the correlation of contact reports with different scope or reality attributes. See sections 3.2.1.7 and 3.2.1.8.

Traceability:
Priority ???

CO 3.2.2.4.10 ELINT Domain Processing

3.2.2.4.10.1 ELINT correlation **shall** be capable of exploiting apriori information about signal characteristics when available, but **shall** not be dependent on apriori information so as to be capable of processing unidentified reports or data about which little apriori information is available.

Traceability:
Priority ???

3.2.2.4.10.2 The ELINT correlation process includes assembling a set of tracks that are update candidates. Candidates **shall** be initially gathered based on matching or equivalent ELINT Notations (ELNOTs) or signal identification. In general, a precise match **shall** not be required except for cases where high confidence signal identifications are available. Multiple reported ELNOTs **shall** also be considered if contained in the incoming report.

Traceability:
Priority ???

3.2.2.4.10.3 ELINT candidates with matching or equivalent ELNOT or signal identifications **shall** be tested for motion or geographic feasibility, and for parameter feasibility.

Traceability:
Priority ???

3.2.2.4.10.4 ELINT correlation **shall** support Identification / re-identification processing to deal with known inconsistencies in reported ELNOT / signal identification data or unidentified reports.

Traceability:
Priority ???

3.2.2.4.10.5 For statistical correlation, the parameter feasibility screening (as well as all subsequent parameter processing) **shall** include explicit consideration of the accuracy of available parameter information, either explicitly reported by the information source or inferred based on the reporting source capabilities.

Traceability:
Priority ???

3.2.2.4.10.6 Candidates **shall** also be screened based on disregard time criteria. In processing both PRI and Scan information, baseband processing **shall** be applied.

Traceability:
Priority ???

3.2.2.4.10.7 Scoring and decision processing includes the actual evaluation of the reported parameter and geographic information against that contained in the candidate tracks. Reported parameter information (after basebanding) together with parameter stability / uncertainty information (reported or inferred) **shall** be scored against the estimated mean and estimated standard deviation (tolerance) for each parameter in each candidate ELINT track, and combined to form an overall parameter score for each candidate track.

Traceability:
Priority ???

3.2.2.4.10.8 The combination process **shall** include provisions for non-homogeneous overlap in parameters with different candidates (i.e. the common parameters between candidate “a” versus the report will not necessarily be identical to the common parameters between candidate “b” and the report).

Traceability:
Priority ???

3.2.2.4.10.9 Reported geographic information in the form of either an ellipse area of uncertainty at a specified containment percentage, or a line of bearing report and bearing uncertainty at a specified percentage containment **shall** be scored against the geographic information in the candidate track to form a geographic score.

Traceability:
Priority ???

3.2.2.4.10.10 In those cases where an emitter track is associated to a higher level tactical object, the geographic information for the higher level object **shall** be used for scoring (and all other geographic processing as well) since it represents the union of all geographic information available from all sources, not just geographic information available based on reports of that single emitter.

Traceability:
Priority ???

3.2.2.4.10.11 The geographic score and parameter score for each candidate track **shall** be combined into an overall score again using a self adaptive weighting process, and a decision made between updating one of the candidates, creating a new track object, or declaring an ambiguity based on an optimized minimum risk / cost of error criterion.

Traceability:
Priority ???

3.2.2.4.10.12 The system **shall** provide a site templating capability to support aggregation of ELINT track objects associated with a common function or mission.

Traceability:
Priority ???

3.2.2.4.10.13 Land based mobile ELINT processing **shall** also consider equipment breakdown and setup times in determining if an emitter has relocated

Traceability:
Priority ???

CO 3.2.2.4.11 TADIL Domain Processing

3.2.2.4.11.1 The system **shall** be capable of simultaneously accepting an input from multiple TADIL sources to include both their updates and management directives, and replicating the TADIL tactical picture within the Tdb. The system **shall** be capable of accepting inputs from TADIL A, TADIL B, and TADIL J.

Traceability:
Priority ???

3.2.2.4.11.2 Correlation processing of TADIL data **shall** be focused on faithfully replicating the received track picture, and supporting it's integration within the overall tactical picture through association of TADIL tracks with higher level tactical object tracks.

Traceability:
Priority ???

3.2.2.4.11.3 The system **shall** be configurable to perform auto purge of Tdb contents and eliminate TADIL tracks which have ceased being reported.

Traceability:
Priority ???

3.2.2.4.11.4 TADIL processing **shall** be based primarily on received track numbers and management directives, but **shall** also include a secondary correlation scheme to reassociate data in the event that the link goes down and rapidly is reestablished, to automate the reassociation of TADIL tracks whenever possible in spite of block changes in TADIL track numbers associated with the link going down and back up.

Traceability:
Priority ???

3.2.2.4.11.5 Automatic association of TADIL tracks via PIF attribute matching **shall** be supported.

Traceability:
Priority ???

CO 3.2.2.4.12 COMINT Domain Processing

CO 3.2.2.4.13 ACINT Domain Processing

CO 3.2.2.4.14 MTI Domain Processing

CO 3.2.2.5 Data Merging

3.2.2.5.1 The system **shall** support the association and disassociation of reporting domain level track objects to primary high-level tracks. In this state, lower-level tracks continue to exist and are subject to continued updating by the appropriate correlation process, but the high-level track history represents the union of the histories of its lower-level tracks.

Traceability:
Priority ???

3.2.2.5.2 The system **shall** support the association of multiple low-level tracks to a single high-level track. For example, one of the lower-level tracks may be a Link track, another an ELINT track

and a third a GMTI track. The system **shall** support the distribution of these high-low track relationships across a wide area network in order to maintain a common joint perspective.

Traceability:
Priority ???

3.2.2.5.3 Attributes not present in a high-level track **shall** be inherited from a low-level track. The high-level track's attribute **shall** prevail if there are conflicting values between a high-level and a low-level track. The system **shall** allow separation of associated tracks, with inherited attributes of each remaining after the separation.

Traceability:
Priority ???

3.2.2.5.4 The system **shall** support an Entity to Emitter Association database. The system **shall** support the addition, deletion and editing of data which lists particular emitters known to be associated with specific entities. The entity information **shall** consist of attributes such as entity name, entity class, entity type, entity identifying number, flag and entity control number. The emitter information **shall** include information such as the emitter name, ELNOT, and observed operating ranges for PRI, SCAN and RF.

Traceability:
Priority ???

3.2.2.5.5 The system **shall** include an automated capability to evaluate time position histories of similar and dissimilar (e.g. ELINT & Platform, ELINT & TADIL, COMINT & ELINT) source moving track objects, screen the available explicit or inferred attribute information on those track objects, and recommend associations of similar and dissimilar source tracks based on absence of conflicting attributes and the presence of unambiguous and statistically significant degrees of correspondence in the time position histories.

Traceability:
Priority ???

3.2.2.5.6 If a single contact report is subject to multiple correlation processes, and is simultaneously matched with a high level track/entity and a lower level track, and no attribute conflicts result, then automatic association **shall** occur.

Traceability:
Priority ???

3.2.2.5.7 The system **shall** allow the merging of two tracks with non conflicting attributes into a single track record with a combined track history. In this case the two tracks lose their individual identity.

Traceability:
Priority ???

JMTK 3.2 Joint Mapping Tool Kit (JMTK) Functional Requirements

For those stated requirements below, the Joint Mapping Tool Kit (JMTK) services shall:

JMTK 3.2.1 Geospatial Analysis.

3.2.1.1 Support application selection of input and output units of measurement for all functions.

Traceability: FRD 1.1
Priority 1

3.2.1.1.1 The variety of units will include

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.1 Dates

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.2 Hours

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.3 Minutes

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.4 Seconds

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.5 Feet

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.6 Meters

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.7 Fathoms

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.8 Kilometers

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.9 Square kilometers

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.10 Hectares

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.11 Nautical miles

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.12 Square miles

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.13 Degrees

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.14 Minutes of arc

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.15 Seconds of arc

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.16 Radians.

Traceability: FRD 1.1
Priority 1

3.2.1.1.2 Degrees may be input in the following formats:

Traceability: FRD 1.1
Priority 1

3.2.1.1.2.1 Degrees, minutes seconds mode

Traceability: FRD 1.1
Priority 1

3.2.1.1.2.2 Degrees, decimal degree

Traceability: FRD 1.1
Priority 1

3.2.1.1.2.3 Degrees, minutes, and decimal minute

Traceability: FRD 1.1
Priority 1

3.2.1.1.2.4 Entry of degrees will allow for at least seven decimal places

Traceability: FRD 1.1
Priority 1

3.2.1.1.2.5 Entry of seconds will allow for at least three decimal places.

Traceability: FRD 1.1
Priority 1

3.2.1.1.2.6 Entry of hemisphere will be allowed in (NSEW) and (+-) format

Traceability: FRD 1.1
Priority 1

3.2.1.1.3 The time and date format will be transmitted and entered in the YYYYMMDD HHMMSS

Traceability: FRD 1.1
Priority 1

3.2.1.1.4 Set the unit of measurement to be used in the display of all angle calculations

Traceability: FRD 1.1
Priority 1

3.2.1.1.5 Set the unit of measurement for the display of all elevation calculations.

Traceability: FRD 1.1
Priority 1

3.2.1.1.6 Set the unit of measurement for the display of all position calculations.

Traceability: FRD 1.1
Priority 1

3.2.1.2 Will perform terrain masking for one or more ground based observers utilizing elevation data format as they apply.

Traceability: FRD 1.2
Priority 1

3.2.1.2.1 Observer height will be considered

Traceability: FRD 1.2
Priority 1

3.2.1.2.2 Target height will be considered

Traceability: FRD 1.2
Priority 1

3.2.1.2.3 The earth curvature will be considered, with the curvature being modeled by selectable standard spheroids

Traceability: FRD 1.2
Priority 1

3.2.1.2.4 The terrain-shadowed areas will be represented for any above ground altitude, including ground level.

Traceability: FRD 1.2
Priority 1

3.2.1.2.5 Terrain masking can be constrained by

Traceability: FRD 1.2
Priority 1

3.2.1.2.5.1 Two-dimensional range

Traceability: FRD 1.2
Priority 1

3.2.1.2.5.2 Three-dimensional range

Traceability: FRD 1.2
Priority 1

3.2.1.2.5.3 Constrained by sectors of a circle or sphere

Traceability: FRD 1.2
Priority 1

3.2.1.2.6 Will permit accounting for atmospheric refraction effects.

Traceability: FRD 1.2
Priority 1

3.2.1.2.7 Provide the capability to filter the reduced resolution elevation data such that the following values are retrievable over a specified geographic area.

Traceability: FRD 1.2
Priority 1

3.2.1.2.7.1 Maximum elevation values

Traceability: FRD 1.2
Priority 1

3.2.1.2.7.2 Minimum elevation values

Traceability: FRD 1.2
Priority 1

3.2.1.2.7.3 Average elevation values

Traceability: FRD 1.2
Priority 1

3.2.1.2.8 The system will provide support for both optical and electromagnetic LOS calculations. Frequencies to be supported for electromagnetic LOS are to be supplied

Traceability: FRD 1.2
Priority 1

3.2.1.2.9 Provide the capability for fast retrieval of DTED data in the systems that are not extremely powerful.

Traceability: FRD 1.2
Priority 1

3.2.1.2.10 Set the range to be used to generate terrain masks

Traceability: FRD 1.2
Priority 1

3.2.1.2.11 Set the altitude to be used to cut and display a terrain mask

Traceability: FRD 1.2
Priority 1

3.2.1.2.12 Generate the Min/Max elevation of a Feature

Traceability: FRD 1.2
Priority 1

3.2.1.2.13 Generate a Terrain Mask.

Traceability: FRD 1.2
Priority 1

3.2.1.3 Calculate point-to-point line-of-sight (LOS) utilizing elevation data retrieved from the Spatial Database Management System (SDBMS).

Traceability: FRD 1.3
Priority 2

3.2.1.3.1 Observer height will be considered

Traceability: FRD 1.3
Priority 2

3.2.1.3.2 Target height will be considered

Traceability: FRD 1.3
Priority 2

3.2.1.3.3 Three dimensional range will be considered

Traceability: FRD 1.3
Priority 2

3.2.1.3.4 Provide probability of detection isopleths based on the specified sensor or weapon systems assets and incorporate aircraft radar cross section if included in the application-specified

Traceability: FRD 1.3
Priority 2

3.2.1.3.5 Calculate an area that can be traversed by a moving target based on inputs of

Traceability: FRD 1.3
Priority 2

3.2.1.3.5.1 Elapsed time

Traceability: FRD 1.3
Priority 2

3.2.1.3.5.2 Entity velocity

Traceability: FRD 1.3
Priority 2

3.2.1.3.5.3 This area will be included in LOS outputs for airborne and ground Targets.

Traceability: FRD 1.3
Priority 2

3.2.1.3.6 Incorporate terrain masking to determine the altitude above ground level at which aircraft and Entity ground asset intervisibility occurs

Traceability: FRD 1.3
Priority 2

3.2.1.3.7 The earth curvature will be considered, with the curvature being modeled by selectable standard spheroids

Traceability: FRD 1.3
Priority 2

3.2.1.3.8 Support both optical and electromagnetic LOS calculations, Frequencies to be supported for electromagnetic LOS are to be supplied. The effects and conditions to be considered are
Traceability: FRD 1.3
Priority 2

3.2.1.3.8.1 Surface structures
Traceability: FRD 1.3
Priority 2

3.2.1.3.8.2 Time-of-day
Traceability: FRD 1.3
Priority 2

3.2.1.3.8.3 Elevation model accuracy
Traceability: FRD 1.3
Priority 2

3.2.1.3.8.4 Atmospheric and tropospheric conditions will be considered
Traceability: FRD 1.3
Priority 2

3.2.1.4 Calculate vegetation effects on intervisibility utilizing obscuring features found in any of the DMA feature data bases available.
Traceability: FRD 1.4
Priority 3

3.2.1.4.1 Obscuring features are:
Traceability: FRD 1.4
Priority 3

3.2.1.4.1.1 Vegetation
Traceability: FRD 1.4
Priority 3

3.2.1.4.1.2 Urban areas
Traceability: FRD 1.4
Priority 3

3.2.1.4.1.3 Tactical obscurants (e.g. smoke, weather obscurants such as fog)
Traceability: FRD 1.4
Priority 3

3.2.1.4.2 This capability will augment any terrain masking or line-of-sight calculation.
Traceability: FRD 1.4
Priority 3

3.2.1.4.3 Calculations will take into account selected feature attributes
Traceability: FRD 1.4
Priority 3

3.2.1.4.3.1 Deciduous vs. coniferous
Traceability: FRD 1.4
Priority 3

3.2.1.4.3.2 Foliage height
Traceability: FRD 1.4
Priority 3

3.2.1.4.3.3 Canopy closure
Traceability: FRD 1.4
Priority 3

3.2.1.4.3.4 Season

Traceability: FRD 1.4
Priority 3

3.2.1.4.4 Calculations will take into account three operator entered structure attributes

Traceability: FRD 1.4
Priority 3

3.2.1.4.4.1 Structure height

Traceability: FRD 1.4
Priority 3

3.2.1.4.4.2 Structure width

Traceability: FRD 1.4
Priority 3

3.2.1.4.4.3 Structure midpoint

Traceability: FRD 1.4
Priority 3

3.2.1.4.5 Results will be represented in at least three categories:

Traceability: FRD 1.4
Priority 3

3.2.1.4.5.1 Definitely masks target

Traceability: FRD 1.4
Priority 3

3.2.1.4.5.2 Definitely does not mask target

Traceability: FRD 1.4
Priority 3

3.2.1.4.5.3 May have an effect on LOS

Traceability: FRD 1.4
Priority 3

3.2.1.5 Calculate distance by combining and utilizing

Traceability: FRD 1.5
Priority 1

3.2.1.5.1 Great circle technique

Traceability: FRD 1.5
Priority 1

3.2.1.5.2 Rhumb line technique

Traceability: FRD 1.5
Priority 1

3.2.1.5.3 Straight line technique

Traceability: FRD 1.5
Priority 1

3.2.1.5.4 Technique used will be application selectable or automatically provided, depending on distance measurement desired (e.g., straight line for a change in altitude; great circle for a common elevation)

Traceability: FRD 1.5
Priority 1

3.2.1.5.5 Measure ground features or arbitrary ground paths for

Traceability: FRD 1.5
Priority 1

3.2.1.5.5.1 Gridded products

Traceability: FRD 1.5
Priority 1

3.2.1.5.5.2 Vector products

Traceability: FRD 1.5
Priority 1

3.2.1.6 Provide capability to automatically identify locations for threats and sensors which optimize the area visible to that Entity and sensor.

Traceability: FRD 1.6
Priority 3

3.2.1.6.1 Capability would only apply to areas found within either the threat or the sensor location error ellipses

Traceability: FRD 1.6
Priority 3

3.2.1.6.2 Capability would utilize elevation data retrieved from the SDBMS.

Traceability: FRD 1.6
Priority 3

3.2.1.6.3 Capability will be implemented so as to apply this function to selected threats and sensors.

Traceability: FRD 1.6
Priority 3

3.2.1.6.4 The capability will be provided to relocate the threat/sensor laterally (parallel to the surface), vertically, or both laterally and vertically.

Traceability: FRD 1.6
Priority 3

3.2.1.7 Provide sensor prediction capabilities which will predict, at moderate fidelity, the output of specific families of sensors to the detail of the data available.

Traceability: FRD 1.7
Priority 2

3.2.1.7.1 The sensor families featured will include

Traceability: FRD 1.7
Priority 2

3.2.1.7.1.1 Real beam ground map radar

Traceability: FRD 1.7
Priority 2

3.2.1.7.1.2 Pulse doppler radar

Traceability: FRD 1.7
Priority 2

3.2.1.7.1.3 Synthetic aperture radar

Traceability: FRD 1.7
Priority 2

3.2.1.7.1.4 Low light level television

Traceability: FRD 1.7
Priority 2

3.2.1.7.1.5 Forward looking infrared (FLIR)

Traceability: FRD 1.7
Priority 2

3.2.1.7.1.6 Targeting infrared.

Traceability: FRD 1.7
Priority 2

3.2.1.7.2 Predictions will be featured in the orientation that the real sensors are represented to the observer

Traceability: FRD 1.7
Priority 2

3.2.1.7.3 The earth curvature will be considered, with the curvature being modeled by selectable standard spheroids

Traceability: FRD 1.7
Priority 2

3.2.1.7.4 The simulation will include

Traceability: FRD 1.7
Priority 2

3.2.1.7.4.1 Radar simulation.

Traceability: FRD 1.7
Priority 2

3.2.1.7.4.2 FLIR simulation.

Traceability: FRD 1.7
Priority 2

3.2.1.7.4.3 Synthetic aperture radar (SAR) simulation.

Traceability: FRD 1.7
Priority 2

3.2.1.8 Provide the capability to generate a terrain profile from elevation data and vertical obstruction data provided by the application.

Traceability: FRD 1.8
Priority 1

3.2.1.8.1 Profile will be calculated as

Traceability: FRD 1.8
Priority 1

3.2.1.8.1.1 Straight line segment

Traceability: FRD 1.8
Priority 1

3.2.1.8.1.2 Series of line segments

Traceability: FRD 1.8
Priority 1

3.2.1.8.1.3 The data will be available as a linear feature from the spatial data base

Traceability: FRD 1.8
Priority 1

3.2.1.8.2 Have capability to calculate LOS with the terrain profile

Traceability: FRD 1.8
Priority 1

3.2.1.8.3 Start and end location for LOS calculations will each have a selectable height

Traceability: FRD 1.8
Priority 1

3.2.1.8.4 The earth curvature will be considered in the calculation, with the curvature being modeled by selectable standard spheroids

Traceability: FRD 1.8
Priority 1

3.2.1.8.5 Optionally, the profile view will use as the elevation of the path the highest elevation within a application-specified distance to the right and left of the profile baseline path

Traceability: FRD 1.8
Priority 1

3.2.1.8.6 Mark the locations of vertical obstructions available in the spatial database within a specified distance to the right and left of the profile baseline path.

Traceability: FRD 1.8
Priority 1

3.2.1.9 Provide the capability to generate terrain perspective views utilizing. (See Paragraph 2.20)

Traceability: FRD 1.9
Priority 2

3.2.1.9.1 Digital Terrain Elevation Data

Traceability: FRD 1.9
Priority 2

3.2.1.9.2 Geocoded imagery

Traceability: FRD 1.9
Priority 2

3.2.1.9.3 Any features available in the spatial data base, including overview information

Traceability: FRD 1.9
Priority 2

3.2.1.9.4 Various ways to represent the terrain will be available

Traceability: FRD 1.9
Priority 2

3.2.1.9.4.1 Smooth

Traceability: FRD 1.9
Priority 2

3.2.1.9.4.2 Faceted

Traceability: FRD 1.9
Priority 2

3.2.1.9.4.3 Wire net

Traceability: FRD 1.9
Priority 2

3.2.1.9.4.4 Shading can be arbitrary and may be simulating sun, moon, other source, or arbitrary placement of lighting.

Traceability: FRD 1.9
Priority 2

3.2.1.9.4.5 Elevation contour banded

Traceability: FRD 1.9
Priority 2

3.2.1.9.5 Perspective views may be generated from any observer position and orientation to a position of interest located at any height

Traceability: FRD 1.9
Priority 2

3.2.1.9.6 The perspective angular field of view, depth of view and altitude (i.e. roll, pitch, yaw, etc.) of generation will be totally selectable

Traceability: FRD 1.9
Priority 2

3.2.1.9.7 The light source position will be selectable by date and time or by arbitrary placement (azimuth and declination)

Traceability: FRD 1.9
Priority 2

3.2.1.9.8 The earth horizon will be factored into view generation

Traceability: FRD 1.9
Priority 2

3.2.1.9.9 A representation of the desired route of the observer will be included.

Traceability: FRD 1.9
Priority 2

3.2.1.9.10 Include the capability to generate a perspective view, at any point along the a path of locations

Traceability: FRD 1.9
Priority 2

3.2.1.9.11 Provide lighting effects of

Traceability: FRD 1.9
Priority 2

3.2.1.9.11.1 Clear sky

Traceability: FRD 1.9
Priority 2

3.2.1.9.11.2 Hazy sky

Traceability: FRD 1.9
Priority 2

3.2.1.9.11.3 Overcast sky

Traceability: FRD 1.9
Priority 2

3.2.1.9.11.4 Fog

Traceability: FRD 1.9
Priority 2

3.2.1.9.11.5 Haze

Traceability: FRD 1.9
Priority 2

3.2.1.9.11.6 Precipitation

Traceability: FRD 1.9
Priority 2

3.2.1.9.12 View quality options of lighting effects and visibility attenuation will, be calculated based on weather forecasts or historical weather conditions

Traceability: FRD 1.9
Priority 2

3.2.1.9.13 Generate perspective views for

Traceability: FRD 1.9
Priority 2

3.2.1.9.13.1 Visual prediction

Traceability: FRD 1.9
Priority 2

3.2.1.9.13.2 Radar

Traceability: FRD 1.9
Priority 2

3.2.1.9.13.3 Synthetic aperture radar prediction

Traceability: FRD 1.9
Priority 2

3.2.1.10 Provide a capability to generate perspective views of threat envelopes coupled with a terrain representation of the area involved in the scene.

Traceability: FRD 1.10
Priority 3

3.2.1.10.1 Envelopes will vary in representation so as to portray the overlap of the threat envelopes for multiple sensors.

Traceability: FRD 1.10
Priority 3

3.2.1.10.2 Envelopes will be displayed with terrain and feature representations as output from the terrain perspective viewing function excluding the imagery overlay option.

Traceability: FRD 1.10
Priority 3

3.2.1.10.3 Perspective views may be generated from any observer position and orientation to a position of interest located at any height. This capability to include reversing the view and looking from the specific position of interest toward the observer.

Traceability: FRD 1.10
Priority 3

3.2.1.10.4 Features highlighted in the perspective scene (including the target) that are terrain masked from the observer will be represented as such.

Traceability: FRD 1.10
Priority 3

3.2.1.10.5 The perspective angular field of view, depth of view and attitude (i.e.; roll, pitch, yaw) of generation will be totally selectable

Traceability: FRD 1.10
Priority 3

3.2.1.10.6 The light source (i.e. sun or moon) position will be selectable by date and time or by arbitrary placement (azimuth and declination)

Traceability: FRD 1.10
Priority 3

3.2.1.10.7 The earth horizon will be factored into view generation

Traceability: FRD 1.10
Priority 3

3.2.1.10.8 A representation of the desired route of the observer will be included

Traceability: FRD 1.10
Priority 3

3.2.1.10.9 The specific shape of the threat envelope will be selectable by defining the sensor location, height, range, azimuth, inclination, horizontal and vertical angular fields of view. Only the height and range of the sensor need be specified.

Traceability: FRD 1.10
Priority 3

3.2.1.10.10 The environment will be calculated using a database of threat system characteristics. Ground-based, airborne, and shipborne weapon systems, early warning and ground control intercept radar and small arms and armament will be available.

Traceability: FRD 1.10
Priority 3

3.2.1.10.11 Provide the capability to provide probability of detection isopleths (lines of equal probability) for specified threat systems and specific aircraft.

Traceability: FRD 1.10
Priority 3

3.2.1.10.12 Interface will be allowed to choose specified probabilities for which to display the isopleths.

Traceability: FRD 1.10
Priority 3

3.2.1.10.13 Calculate the maximum detection range of a radar.

Traceability: FRD 1.10
Priority 3

3.2.1.11 Perform terrain feature categorization for a given AOI using selected terrain.

Traceability: FRD 1.11
Priority 2

3.2.1.11.1 Allow the selection by type and attribute of surface feature coverage and vertical obstructions. This includes

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.1 Vegetation

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.2 Soils

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.3 Transportation

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.4 Drainage

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.5 Slope

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.6 Industry

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.7 Obstacles

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.8 Generate the vector data for ridges and channels.

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.9 Calculate the magnetic compass declination for coordinate and date

Traceability: FRD 1.11
Priority 2

3.2.1.12 Step-through

Traceability: FRD 1.12
Priority 2

3.2.1.12.1 Calculate a sequence of windows representing discrete views, for any perspective view type listed in paragraph 1.9, and any look angle and field of view.

Traceability: FRD 1.12
Priority 2

3.2.1.12.2 Provide the capability to specify the starting and ending points.

Traceability: FRD 1.12
Priority 2

3.2.1.12.2.1 Route fly-through

Traceability: FRD 1.12
Priority 2

3.2.1.12.2.2 The number of window updates to be displayed along this route

Traceability: FRD 1.12
Priority 2

3.2.1.12.2.3 Window updates will correspond to equally-spaced changes in position of the viewpoint along the route between the starting and ending points of the fly-through

Traceability: FRD 1.12
Priority 2

3.2.1.12.3 Provide the fly-through sequence as to

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.1 Start

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.2 Stop

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.3 Pause

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.4 Restart

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.5 Reverse

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.6 Forward

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.7 Slow

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.8 Speed-up

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.9 Go to start

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.10 Go to end

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.11 Go to specified location

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.12 Go to specified time

Traceability: FRD 1.12
Priority 2

3.2.1.13 Have the capability to perform cross country movement (CCM) analysis using data retrieved from the SDBMS.

Traceability: FRD 1.13
Priority 2

3.2.1.13.1 Compute a maximum speed for a selected entity and given AOI, based on

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.1 Slope

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.2 Vegetation

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.3 Soil

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.4 Surface roughness

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.5 Drainage features

Traceability: FRD 1.13
Priority 2

3.2.1.13.2 The analysis can be restricted to

Traceability: FRD 1.13
Priority 2

3.2.1.13.2.1 On-road-only

Traceability: FRD 1.13
Priority 2

3.2.1.13.2.2 Off-road-only

Traceability: FRD 1.13
Priority 2

3.2.1.13.2.3 Mixed travel

Traceability: FRD 1.13
Priority 2

3.2.1.13.3 Consider the effects of weather conditions

Traceability: FRD 1.13
Priority 2

3.2.1.13.3.1 Precipitation over time

Traceability: FRD 1.13
Priority 2

3.2.1.13.3.2 Fog

Traceability: FRD 1.13
Priority 2

3.2.1.13.3.3 Temperature

Traceability: FRD 1.13
Priority 2

3.2.1.13.4 The results will be depicted as areas of go, slow-go, no-go and unevaluated for the selected vehicle type or aggregate of vehicles or other entities.

Traceability: FRD 1.13
Priority 2

3.2.1.13.5 The reasons for no-go and slow-go will be computed for each region (e.g. soil strength, slope, obstacle, braking)

Traceability: FRD 1.13
Priority 2

3.2.1.13.6 Perform cross country movement on the specified surface material code (SMC) product.

Traceability: FRD 1.13
Priority 2

3.2.1.13.7 Perform cross country movement on the specified cross country movement (CCM) information product.

Traceability: FRD 1.13
Priority 2

3.2.1.13.8 Generate a path profile composed of a series of latitudes, longitudes, and altitudes at each point.

Traceability: FRD 1.13
Priority 2

3.2.1.14 Perform time-of-travel computations.

Traceability: FRD 1.14
Priority 2

3.2.1.14.1 Provide the capability to

Traceability: FRD 1.14
Priority 2

3.2.1.14.1.1 Select a vehicle type

Traceability: FRD 1.14
Priority 2

3.2.1.14.1.2 Define a vehicle type

Traceability: FRD 1.14
Priority 2

3.2.1.14.1.3 Edit a vehicle type

Traceability: FRD 1.14
Priority 2

3.2.1.14.2 Provide the capability to select time of travel computations according to a selected:

Traceability: FRD 1.14
Priority 2

3.2.1.14.2.1 Vehicle type

Traceability: FRD 1.14
Priority 2

3.2.1.14.2.2 Restriction to on-road-only

Traceability: FRD 1.14
Priority 2

3.2.1.14.2.3 Restriction to off-road-only

Traceability: FRD 1.14
Priority 2

3.2.1.14.2.4 Mixed travel

Traceability: FRD 1.14
Priority 2

3.2.1.14.3 Time of travel prediction will include the effects of known obstacles

Traceability: FRD 1.14
Priority 2

3.2.1.14.4 Provide the capability to determine and display:

Traceability: FRD 1.14
Priority 2

3.2.1.14.4.1 Total time of travel between specified start and end locations

Traceability: FRD 1.14
Priority 2

3.2.1.14.4.2 Total and partial time of travel along a directed path broken into multiple specified segments.

Traceability: FRD 1.14
Priority 2

3.2.1.15 Provide the capability to select unit movement prediction analysis according to

Traceability: FRD 1.15
Priority 2

3.2.1.15.1 Unit echelon and composition

Traceability: FRD 1.15
Priority 2

3.2.1.15.2 Restriction to on-road-only, off-road-only, or mixed travel.

Traceability: FRD 1.15
Priority 2

3.2.1.15.3 Shortest path (straight-line) or fastest path between way-points, and time interval at which locations are reported

Traceability: FRD 1.15
Priority 2

3.2.1.15.4 Unit movement prediction will also include the effects of known obstacles.

Traceability: FRD 1.15
Priority 2

3.2.1.15.5 Provide the capability to determine and display the predicted unit movement path between specified start and end locations along with time-stamped locations along the path.

Traceability: FRD 1.15
Priority 2

3.2.1.15.6 Provide the capability to determine and display the total and partial predicted unit movements along a directed path which includes one or more specified way-points. Time-stamped locations along the path will also be displayed.

Traceability: FRD 1.15
Priority 2

3.2.1.16 Calculate mobility corridors.

Traceability: FRD 1.16
Priority 2

3.2.1.16.1 Provide the capability to select a unit echelon and composition from a database of units.

Traceability: FRD 1.16
Priority 2

3.2.1.16.2 Provide the capability to select weather conditions based on either historical patterns or current or projected measurements.

Traceability: FRD 1.16
Priority 2

3.2.1.16.3 Provide the capability to determine cross-country movement potential (trafficability) within a specified geographic extent. Cross-country movement potential will include the effects of:

Traceability: FRD 1.16
Priority 2

3.2.1.16.3.1 Weather (including frozen rivers)

Traceability: FRD 1.16
Priority 2

3.2.1.16.3.2 The selected unit echelon/composition (vehicles and/or dismounted combatants).

Traceability: FRD 1.16
Priority 2

3.2.1.16.4 Provide the capability to define an analysis area based on a specified set of perimeter locations.

Traceability: FRD 1.16
Priority 2

3.2.1.16.5 Provide the capability to determine and display mobility corridors within a specified analysis area according to a selected unit echelon/composition, previous cross-country movement potential analysis.

Traceability: FRD 1.16
Priority 2

3.2.1.17 Support air avenues of approach.

Traceability: FRD 1.17
Priority 2

3.2.1.17.1 Provide the capability to select a helicopter group configuration and composition from a database of helicopters.

Traceability: FRD 1.17
Priority 2

3.2.1.17.2 Provide the capability to determine air movement potential within a specified geographic extent. Air movement potential will include the effects of:

Traceability: FRD 1.17
Priority 2

3.2.1.17.2.1 Weather

Traceability: FRD 1.17
Priority 2

3.2.1.17.2.2 Specified lower air corridor altitude

Traceability: FRD 1.17
Priority 2

3.2.1.17.2.3 Specified upper air corridor altitude

Traceability: FRD 1.17
Priority 2

3.2.1.17.2.4 The selected helicopter group configuration and composition

Traceability: FRD 1.17
Priority 2

3.2.1.17.3 Air movement potential will also include the effects of vertical obstacles, terrain (e.g. mountains, canyons), and vegetation

Traceability: FRD 1.17
Priority 2

3.2.1.18 Provide the capability to determine and display air mobility corridors within a specified analysis area according to a selected helicopter group configuration/composition, and previous air movement potential analysis.

Traceability: FRD 1.18
Priority 2

3.2.1.19 Have the capability to calculate and store the area gradient (i.e. slope), including direction in a particular area of interest from elevation data. Be able to specify ranges such that gradients within a specified tolerance

Traceability: FRD 1.19
Priority 2

3.2.1.20 Compute the point-to-point slope, including direction, between two given points, based on elevation data DTED

Traceability: FRD 1.20
Priority 1

3.2.1.21 Have the capability to calculate the ridge and valley lines in a particular area of interest from DTED.

Traceability: FRD 1.21
Priority 1

3.2.1.21.1 Be able to vary the thresholds employed in generating these features

Traceability: FRD 1.21
Priority 1

3.2.1.21.1.1 Skeletonizing

Traceability: FRD 1.21
Priority 1

3.2.1.21.1.2 Broadening

Traceability: FRD 1.21
Priority 1

3.2.1.22 Perform trafficability analysis along a specified route for lines of communication and transportation.

Traceability: FRD 1.22
Priority 2

3.2.1.22.1 Calculate time to travel a given route based on the impedance factors of surface materials, segment width and slope.

Traceability: FRD 1.22
Priority 2

3.2.1.22.2 Collect options and determine the possible vehicle path.

Traceability: FRD 1.22
Priority 2

3.2.1.22.3 Calculate all possible radial paths and distances traversed of a vehicle for a given period of time from a given start point.

Traceability: FRD 1.22
Priority 2

3.2.1.22.4 Calculate all or specified number of shortest path through a road network given start and end points.

Traceability: FRD 1.22
Priority 2

3.2.1.22.5 Calculate all or specified number of optimal path.

Traceability: FRD 1.22
Priority 2

3.2.1.23 Have the capability to produce and save elevation tinted (color contour banded) depiction of the terrain data in 2-d (plan view).

Traceability: FRD 1.23
Priority 1

3.2.1.23.1 Capability to determine the minimum and maximum elevations in the selected region

Traceability: FRD 1.23
Priority 1

3.2.1.23.2 Allow selectable map scale, AOI size, base elevation, interval size and interval colors in the generation of the elevation tinted maps.

Traceability: FRD 1.23
Priority 1

3.2.1.24 Produce and save elevation shaded (light source relief shading) depiction of the terrain data in 2-d (plan view). The light source position will be selectable by the time and date of the desired depiction.

Traceability: FRD 1.24
Priority 2

3.2.1.24.1 Select scale, AOI size, and light source (i.e. sun, moon) position by date and time or arbitrary placement (i.e. azimuth and declination).

Traceability: FRD 1.24
Priority 2

3.2.1.25 Have the capability to combine raster, gridded, and vector data to form a single raster result.

Traceability: FRD 1.25
Priority 1

3.2.1.25.1 Both elevation tinted (color contour banding) and elevation shaded (light source relief shading) representations may be fused into a composite image (relief shaded elevation contour banded image).

Traceability: FRD 1.25
Priority 1

3.2.1.25.2 Support update of raster maps and charts with vector and image data.

Traceability: FRD 1.25
Priority 1

3.2.1.25.3 Support augmentation of imagery with vector data.

Traceability: FRD 1.25
Priority 1

3.2.1.25.4 Calculate the color histogram of the designated image area.

Traceability: FRD 1.25
Priority 1

3.2.1.26 Have the capability to produce a heading between two geographic coordinates.

Traceability: FRD 1.26
Priority 1

3.2.1.26.1 Headings will be produced in either

Traceability: FRD 1.26
Priority 1

3.2.1.26.1.1 True values

Traceability: FRD 1.26
Priority 1

3.2.1.26.1.2 Magnetic values

Traceability: FRD 1.26
Priority 1

3.2.1.26.2 Function will comply with DoD tech. Note TN 8222-01-87

Traceability: FRD 1.26
Priority 1

3.2.1.27 Perform precise monoscopic positioning based upon.

Traceability: FRD 1.27
Priority 2

3.2.1.27.1 Imagery managed by the SDBMS

Traceability: FRD 1.27
Priority 2

3.2.1.27.2 Calculate the accuracy of a position selected from image data.

Traceability: FRD 1.27
Priority 2

3.2.1.27.3 Calculate the horizontal accuracy of a position.

Traceability: FRD 1.27
Priority 2

3.2.1.27.4 Derive positional coordinates of selected points mensurated on.

Traceability: FRD 1.27
Priority 2

3.2.1.27.6.1 Standard ADRI

Traceability: FRD 1.27
Priority 2

3.2.1.27.6.2 CMS-formatted ADRI

Traceability: FRD 1.27
Priority 2

3.2.1.27.6.3 CIB imagery

Traceability: FRD 1.27
Priority 2

3.2.1.27.7 Calculate absolute error of point positions at 90% circular error (CE).

Traceability: FRD 1.27
Priority 2

3.2.1.27.7.1 Linear error (LE)

Traceability: FRD 1.27
Priority 2

3.2.1.27.7.2 Spherical error (SE) from contributors:

Traceability: FRD 1.27
Priority 2

3.2.1.27.7.2.1 Elevation Data

Traceability: FRD 1.27
Priority 2

3.2.1.27.7.2.2 ADRI standard imagery

Traceability: FRD 1.27
Priority 2

3.2.1.27.7.2.3 CMS-formatted ADRI imagery and CIB

Traceability: FRD 1.27
Priority 2

3.2.1.27.7.2.4 Displayed scale

Traceability: FRD 1.27
Priority 2

3.2.1.27.7.2.5 Cursor precision

Traceability: FRD 1.27
Priority 2

3.2.1.27.7.2.6 Local geocoded imagery (if usable)

Traceability: FRD 1.27
Priority 2

3.2.1.28 Provide the capability to store and retrieve the results of analytical calculations with a time date stamp such that they can be called back at a later time.

Traceability: FRD 1.28
Priority 1

JMTK 3.2.2 Display Functionality Requirements

3.2.2.1 Support selection of input and output units of measurement for all functions. (Refer to Paragraph 1.1)

Traceability: FRD 2.1
Priority 1

3.2.2.2 Perform coordinate and datum transformations

Traceability: FRD 2.2
Priority 1

3.2.2.2.1 Convert latitude longitude coordinates from one datum to another.
Traceability: FRD 2.2
Priority 1

3.2.2.2.2 Convert a decimal degree to a radian value.
Traceability: FRD 2.2
Priority 1

3.2.2.2.3 Convert an alphanumeric GEOREF coordinate to latitude/longitude.
Traceability: FRD 2.2
Priority 1

3.2.2.2.4 Convert a lat/long coordinate to alphanumeric GEOREF.
Traceability: FRD 2.2
Priority 1

3.2.2.2.5 Convert lat/long to numeric UPS coordinates.
Traceability: FRD 2.2
Priority 1

3.2.2.2.6 Convert lat/long to numeric UTM coordinates.
Traceability: FRD 2.2
Priority 1

3.2.2.2.7 Convert a latitude/longitude coordinate to an alphanumeric UPS coordinate.
Traceability: FRD 2.2
Priority 1

3.2.2.2.8 Convert a latitude/longitude coordinate to an alphanumeric UTM coordinate.
Traceability: FRD 2.2
Priority 1

3.2.2.2.9 Convert numeric UPS coordinates to lat/long.
Traceability: FRD 2.2
Priority 1

3.2.2.2.10 Convert numeric UTM coordinates to lat/long.
Traceability: FRD 2.2
Priority 1

3.2.2.2.11 Convert a radian value to decimal degrees.
Traceability: FRD 2.2
Priority 1

3.2.2.2.12 Convert screen pixel positions to world (lat./long) positions.
Traceability: FRD 2.2
Priority 1

3.2.2.2.13 Convert an alphanumeric UPS coordinate to a latitude/ longitude coordinate.
Traceability: FRD 2.2
Priority 1

3.2.2.2.14 Convert an alphanumeric UTM coordinate to a latitude/ longitude coordinate.
Traceability: FRD 2.2
Priority 1

3.2.2.2.15 Convert view surface coordinates to lat/long.
Traceability: FRD 2.2
Priority 1

3.2.2.2.16 Convert lat/long to view surface coordinates.
Traceability: FRD 2.2
Priority 1

3.2.2.2.17 Set the southwest and northeast coordinates of the area of interest.
Traceability: FRD 2.2
Priority 1

3.2.2.2.18 Convert latitude/longitude to screen pixel positions.
Traceability: FRD 2.2
Priority 1

3.2.2.2.19 Support conversion of multiple coordinates
Traceability: FRD 2.2
Priority 1

3.2.2.2.20 Re-initialize the system by reloading the named display configuration file.
Traceability: FRD 2.2
Priority 1

3.2.2.3 Support and manage map windows and map layers.
Traceability: FRD 2.3
Priority 1

3.2.2.3.1 Provide support as to:
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.1 Create
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.2 Name
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.3 Delete
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.4 Hide
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.5 Expose
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.6 Draw
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.7 Refresh
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.8 Recenter
Traceability: FRD 2.3
Priority 1

3.2.2.3.1.9 Catalog

Traceability: FRD 2.3
Priority 1

3.2.2.3.1.10 Snapshot map windows.

Traceability: FRD 2.3
Priority 1

3.2.2.3.2 Be able to select from a list of map windows according to their attributes or metadata.

Traceability: FRD 2.3
Priority 1

3.2.2.3.3 For a map window, be able to set or reset the

Traceability: FRD 2.3
Priority 1

3.2.2.3.3.1 Display scale

Traceability: FRD 2.3
Priority 1

3.2.2.3.3.2 Projection

Traceability: FRD 2.3
Priority 1

3.2.2.3.3.3 Window Size.

Traceability: FRD 2.3
Priority 1

3.2.2.3.4 Support setting and run-time adjustment of the map window display cache size.

Traceability: FRD 2.3
Priority 1

3.2.2.3.5 Be able to create a persistent representation of a map layer that can be

Traceability: FRD 2.3
Priority 1

3.2.2.3.5.1 Stored

Traceability: FRD 2.3
Priority 1

3.2.2.3.5.2 Retrieved

Traceability: FRD 2.3
Priority 1

3.2.2.3.5.3 Interchanged.

Traceability: FRD 2.3
Priority 1

3.2.2.3.6 Within a map window, provide support as to:

Traceability: FRD 2.3
Priority 1

3.2.2.3.6.1 Insert

Traceability: FRD 2.3
Priority 1

3.2.2.3.6.2 Remove

Traceability: FRD 2.3
Priority 1

3.2.2.3.6.3 (Re)order map layers in one or more map windows

Traceability: FRD 2.3
Priority 1

3.2.2.3.6.4 Update graphic depictions in a map layer for geographic data sets selected from the SDBMS, and using symbology selected from a symbology library.

Traceability: FRD 2.3
Priority 1

3.2.2.3.7 Be able to insert or remove one or more map layers into another map layer by reference.

Traceability: FRD 2.3
Priority 1

3.2.2.3.8 Support one background map layer in a map window.

Traceability: FRD 2.3
Priority 1

3.2.2.3.8.1 Be able to designate one map layer as a background map layer for a map window. This map layer is normally intended not to be updated frequently

Traceability: FRD 2.3
Priority 1

3.2.2.3.8.2 Be able to set the background map layer to be an application-supplied neutral-toned color.

Traceability: FRD 2.3
Priority 1

3.2.2.3.9 Support registration of servers (which may be application-supplied) that can be invoked upon application request to draw specialized map layers.

Traceability: FRD 2.3
Priority 1

3.2.2.3.10 Be able to translate between window coordinates and geocoordinates.

Traceability: FRD 2.3
Priority 1

3.2.2.4 Support and manage symbology libraries.

Traceability: FRD 2.4
Priority 1

3.2.2.4.1 Include the Common Warfighter Symbology library compliant with MIL-STD 2525

Traceability: FRD 2.4
Priority 1

3.2.2.4.2 Include a default symbology library for each vector data product supported by the SDBMS

Traceability: FRD 2.4
Priority 1

3.2.2.4.3 Support adding into a symbology library an association between a symbolization behavior and an SDBMS feature(s), and value or range of values for those attribute(s).

Traceability: FRD 2.4
Priority 1

3.2.2.4.4 Other than the Common Warfighter Symbology library will have the capability to

Traceability: FRD 2.4
Priority 1

3.2.2.4.4.1 Create symbology libraries

Traceability: FRD 2.4
Priority 1

3.2.2.4.4.2 Delete symbology libraries.

Traceability: FRD 2.4
Priority 1

3.2.2.4.5 Be able to retrieve a graphic object from a symbology library.

Traceability: FRD 2.4
Priority 1

3.2.2.4.6 Be able to set and retrieve relative positions for annotations (text and otherwise) for a graphic object in a symbology library.

Traceability: FRD 2.4
Priority 1

3.2.2.4.7 Support addition of symbology definitions and associated graphic expressions to the Common Warfighter Symbology library according to MIL-STD 2525.

Traceability: FRD 2.4
Priority 1

3.2.2.4.8 Support additions and deletions or symbology definitions and associated graphic expressions to other libraries.

Traceability: FRD 2.4
Priority 1

3.2.2.4.9 Support interchange of nonstandard symbols. If an application has a symbol that is not in the official MIL-STD 2525, but adheres to the encoding convention, then it should transmit a definition of it via an interchange mechanism.

Traceability: FRD 2.4
Priority 1

3.2.2.4.10 Support filling the frame of a MIL-STD 2525-compliant symbol with

Traceability: FRD 2.4
Priority 1

3.2.2.4.10.1 A specified color

Traceability: FRD 2.4
Priority 1

3.2.2.4.10.2 For a specified region of the frame

Traceability: FRD 2.4
Priority 1

3.2.2.4.10.3 With an arbitrary supplied pixmap which is clipped to the frame.

Traceability: FRD 2.4
Priority 1

3.2.2.5 Support the display of a AOI reference map window associated with one or more other map windows.

Traceability: FRD 2.5
Priority 1

3.2.2.5.1 The AOI reference map window has a larger display scale to include an entire AOI, and includes a footprint for each of the associated map windows.

Traceability: FRD 2.5
Priority 1

3.2.2.5.2 Map layers can be added to the AOI reference map window.

Traceability: FRD 2.5
Priority 1

3.2.2.6 Support the maintenance of a subwindow associated with a map window, which depicts the same contents as that map window at an application-specified magnification.
Traceability: FRD 2.6
Priority 2

3.2.2.7 Support the display of selected metadata information about
Traceability: FRD 2.7
Priority 1

3.2.2.7.1 Data loaded
Traceability: FRD 2.7
Priority 1

3.2.2.7.2 Data available in the SDBMS data dictionary
Traceability: FRD 2.7
Priority 1

3.2.2.7.3 The SDBMS data dictionary
Traceability: FRD 2.7
Priority 1

3.2.2.7.4 Data products produced by DMA
Traceability: FRD 2.7
Priority 1

3.2.2.7.5 Available map layers
Traceability: FRD 2.7
Priority 1

3.2.2.7.6 Available map products
Traceability: FRD 2.7
Priority 1

3.2.2.7.7 Analysis results
Traceability: FRD 2.7
Priority 1

3.2.2.8 Support pan, zoom in and out, recentering, and home redisplay of the map window
Traceability: FRD 2.8
Priority 1

3.2.2.8.1 Be able to pan smoothly or in jumps based on
Traceability: FRD 2.8
Priority 1

3.2.2.8.1.1 Screen distance
Traceability: FRD 2.8
Priority 1

3.2.2.8.1.2 Geographic distance
Traceability: FRD 2.8
Priority 1

3.2.2.8.1.3 Percentage of a map window in all directions
Traceability: FRD 2.8
Priority 1

3.2.2.8.2 The AOI in which panning can be applied is application-defined or can be unconstrained.
Traceability: FRD 2.8
Priority 1

3.2.2.8.3 Have the capability to move the center of a map window by

Traceability: FRD 2.8
Priority 1

3.2.2.8.3.1 Placing the cursor at desired center point.

Traceability: FRD 2.8
Priority 1

3.2.2.8.3.2 Inputting the desired coordinates.

Traceability: FRD 2.8
Priority 1

3.2.2.8.4 Have the capability to resize a map window by placing the cursor at the desired center point or by inputting the desired center point coordinates along with the magnification and reduction factor

Traceability: FRD 2.8
Priority 1

3.2.2.8.5 Have the capability to set specific scales from which to zoom

Traceability: FRD 2.8
Priority 1

3.2.2.8.5.1 Specially handle integral zoom in or out of map layers that can be supported by pixel sampling or replication of raster data

Traceability: FRD 2.8
Priority 1

3.2.2.8.6 Have a capability to resize the a map window by drawing a box around the area to be displayed via opposite corner input.

Traceability: FRD 2.8
Priority 1

3.2.2.8.7 Have the capability to resize the a map window display around a specified center point and a given radius from that point

Traceability: FRD 2.8
Priority 1

3.2.2.9 Provide capability to graphically display the availability of mapping data sets, their coverage and location, for all areas of the earth (polar and non-polar).

Traceability: FRD 2.9
Priority 1

3.2.2.9.1 The application will have the capability to graphically display the contents of the on-line and off-line databases, using information from the DMA digital catalog (MCS).

Traceability: FRD 2.9
Priority 1

3.2.2.9.2 The display will include the coverage and location of geographically referenced scanned material and other local geographically referenced data sets.

Traceability: FRD 2.9
Priority 1

3.2.2.10 Have the capability to manipulate symbology in map layers.

Traceability: FRD 2.10
Priority 1

3.2.2.10.1 Graphic objects will include

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.1 Polylines

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.2 Polymarkers

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.3 Circles

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.4 Arcs

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.5 Ellipses

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.6 Rectangles

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.7 Triangles

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.8 Polygons

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.9 Splines

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.10 Arrows

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.11 Text strings

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.12 Multiple line segment

Traceability: FRD 2.10
Priority 1

3.2.2.10.2 The use of symbol libraries will be supported, and storage or retrieval of symbols in the libraries will be allowed.

Traceability: FRD 2.10
Priority 1

3.2.2.10.3 Support all of the symbols and operations on symbols specified in MIL-STD-2525 [See also MIL-STD 2526.]

Traceability: FRD 2.10
Priority 1

3.2.2.10.4 Support the creation of composite symbols that include multiple grouping of the symbols

Traceability: FRD 2.10
Priority 1

3.2.2.10.5 Predefined and application-defined polygon fill patterns in a library will be supported.
Traceability: FRD 2.10
Priority 1

3.2.2.10.6 Arbitrary graphic object creation will be supported through definition of polygon shape by an application-supplied or interactive drawing function.
Traceability: FRD 2.10
Priority 1

3.2.2.10.6.1 Generate and display Elevation Contour Polygons.
Traceability: FRD 2.10
Priority 1

3.2.2.10.6.2 Generate closed polygons for specified terrain elevations.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7 Symbol and map layer operations will include interactive functions such as move, resize, rotate, highlight, orient, etc. An application can control whether a symbol or map layer can be locked from being manipulated in this manner.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.1 Move an object using the cursor.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.2 Rotate the specified object utilizing the cursor.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.3 Rescale the specified object utilizing the cursor.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.4 Set the line style for the specified polyline primitive of the specified object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.5 Set the line style for the specified vector primitive of the specified object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.6 Set the width for the specified polyline primitive of the specified object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.7 Set the width for the specified vector primitive of the specified object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.8 Support the use of line patterns
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.9 Support the use of fill patterns and color selection of graphic objects
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.10 The application will be able to position graphically an object by its
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.10.1 Center
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.10.2 Corner points
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.10.3 Anchor point
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.10.4 Geocoordinate for its anchor point
Traceability: FRD 2.10
Priority 1

3.2.2.10.7.11 Be able to designate the anchor position pixel (i.e., "hot spot") for which the graphic object will be positioned
Traceability: FRD 2.10
Priority 1

3.2.2.10.8 Support the grouping and ungrouping of graphic objects
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.1 Interactively allow picking of displayed feature or screen object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.2 Interactive selection of map and feature.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.3 Interactively create and position an object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.4 Display the points as polygons in the main window.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.5 Display the points as polylines in the main window.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.6 Display the points as polymarkers in the main window.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.7 Redraw the specified object if changed
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.8 Set the pick identifier for the current feature.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.9 Set the current pick center.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.10 Set the current pick radius.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.11 Set the current value of the pick threshold.
Traceability: FRD 2.10
Priority 1

3.2.2.10.8.12 Support pick points on the screen and then display the distance between those points.
Traceability: FRD 2.10
Priority 1

3.2.2.10.9 Have capability to create a text field which would either be associated with a symbol with a specified pixel offset or be another georeferenced symbol in a map layer
Traceability: FRD 2.10
Priority 1

3.2.2.10.10 Text size, font, style, and orientation will be application-specified.
Traceability: FRD 2.10
Priority 1

3.2.2.10.10.1 Set the font for the specified marker primitive of the specified object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.10.2 Set the font for the specified polymarker primitive of the specified object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.10.3 Set the font for the named primitive.
Traceability: FRD 2.10
Priority 1

3.2.2.10.10.4 Set the font for the specified text primitive of the specified object.
Traceability: FRD 2.10
Priority 1

3.2.2.10.11 Be able to highlight a symbol or set of symbols by any of the following methods:
Traceability: FRD 2.10
Priority 1

3.2.2.10.11.1 Brightness
Traceability: FRD 2.10
Priority 1

3.2.2.10.11.2 Color
Traceability: FRD 2.10
Priority 1

3.2.2.10.11.3 Outlining
Traceability: FRD 2.10
Priority 1

3.2.2.10.11.4 Thickness enhancement
Traceability: FRD 2.10
Priority 1

3.2.2.10.11.5 Blinking

Traceability: FRD 2.10
Priority 1

3.2.2.11 Have the capability to hide and unhide

Traceability: FRD 2.11
Priority 1

3.2.2.11.1 Be able to add and remove feature classes.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.1 Features from a particular data source

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.2 Symbols or map layers.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.3 Delete Sensor Allocation target/threat features.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.4 Delete Sensor Allocation target visibility features.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.5 Delete and erase all objects from the current feature.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.6 Delete and erase the specified object from the current feature.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.7 Delete all objects for a given feature.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.8 Delete the terrain mask which is closest to the position given.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.9 Delete the terrain mask specified by the segment identifier.

Traceability: FRD 2.11
Priority 1

3.2.2.11.1.10 Delete all terrain masks generated and displayed.

Traceability: FRD 2.11
Priority 1

3.2.2.11.2 Decluttering and undecluttering will be

Traceability: FRD 2.11
Priority 1

3.2.2.11.2.1 Keyed to particular scales

Traceability: FRD 2.11
Priority 1

3.2.2.11.2.2 Keyed to specific areas to be displayed

Traceability: FRD 2.11
Priority 1

3.2.2.11.2.3 Keyed by any combination of these techniques

Traceability: FRD 2.11
Priority 1

3.2.2.11.2.4 Keyed by application-specified attributes

Traceability: FRD 2.11
Priority 1

3.2.2.11.3 For VPF data types, the decluttering of the display will allow applications to select each thematic layer of the data sets for display and non-display. The application will have the capability to declutter based on VPF primitives.

Traceability: FRD 2.11
Priority 1

3.2.2.12 Have the capability to change the color of any object in a map layer (excluding imagery and raster maps)

Traceability: FRD 2.12
Priority 1

3.2.2.12.1 Change the map layer color.

Traceability: FRD 2.12
Priority 1

3.2.2.12.2 Set the color for the object identifier.

Traceability: FRD 2.12
Priority 1

3.2.2.12.3 Set the feature color for the track history of the specified object.

Traceability: FRD 2.12
Priority 1

3.2.2.12.4 Set the track history visibility for the specified object.

Traceability: FRD 2.12
Priority 1

3.2.2.13 Provide the capability to create, edit, and display legend and metadata information for symbols, map layers analysis results, and MCG&I data.

Traceability: FRD 2.13
Priority 1

3.2.2.13.1 Size, shape, content and format will be definable

Traceability: FRD 2.13
Priority 1

3.2.2.13.1.1 Display a legend of the coverage display features.

Traceability: FRD 2.13
Priority 1

3.2.2.13.1.2 Display the Precise Monoscopic Positioning (PMP) error of an ADRI point.

Traceability: FRD 2.13
Priority 1

3.2.2.13.1.3 Make the PMP legend no longer visible

Traceability: FRD 2.13
Priority 1

3.2.2.13.1.4 Remove the Coverage legend from the display
Traceability: FRD 2.13
Priority 1

3.2.2.13.1.5 Change the visibility for the ADRG legends indicated.
Traceability: FRD 2.13
Priority 1

3.2.2.13.1.6 Set the visibility of the specified object.
Traceability: FRD 2.13
Priority 1

3.2.2.13.1.7 Change the data for the specified polygon primitive of the specified object.
Traceability: FRD 2.13
Priority 1

3.2.2.13.1.8 Change the style for the specified polygon primitive of the specified object.
Traceability: FRD 2.13
Priority 1

3.2.2.13.1.9 Change the data for the specified polyline primitive of the specified object.
Traceability: FRD 2.13
Priority 1

3.2.2.13.2 Contents will include the accuracy and resolution information extracted from the original DMA data header information for the specific data used in a particular display
Traceability: FRD 2.13
Priority 1

3.2.2.13.3 Be able to include or have access to the legend information associated with the ADRG maps for both the general class of maps and the chart specific information
Traceability: FRD 2.13
Priority 1

3.2.2.13.4 Have the capability to display all attributes for all
Traceability: FRD 2.13
Priority 1

3.2.2.13.4.1 Map date information
Traceability: FRD 2.13
Priority 1

3.2.2.13.4.2 Accuracy information
Traceability: FRD 2.13
Priority 1

3.2.2.13.4.3 Series information
Traceability: FRD 2.13
Priority 1

3.2.2.13.4.4 Resolution information.
Traceability: FRD 2.13
Priority 1

3.2.2.13.4.5 Have the capability to query a location in a map background window for such information as map date, accuracy, series, resolution.
Traceability: FRD 2.13
Priority 1

3.2.2.13.5 Provide the capability to extract information from the database concerning objects that are displayed and related information. If the database contains information about communication links, then the application should display this as well.
Traceability: FRD 2.13
Priority 1

3.2.2.14 Have the capability to display grids for supported coordinate system on any map display.
Traceability: FRD 2.14
Priority 1

3.2.2.14.1 Latitude and longitude
Traceability: FRD 2.14
Priority 1

3.2.2.14.2 Gauss-Kruger, WAC/WAG
Traceability: FRD 2.14
Priority 1

3.2.2.14.3 Sexagesimal coordinates.
Traceability: FRD 2.14
Priority 1

3.2.2.14.4 Universal Transverse Mercator (UTM) grid
Traceability: FRD 2.14
Priority 1

3.2.2.14.5 Military Grid Reference System (MGRS)
Traceability: FRD 2.14
Priority 1

3.2.2.14.6 World Geographic Reference System (GEOREF) grid
Traceability: FRD 2.14
Priority 1

3.2.2.15 Have the capability to perform cursor-oriented queries on map.
Traceability: FRD 2.15
Priority 1

3.2.2.15.1 Will generate and display the geocoordinate lat/long/elevation coordinate sets corresponding to the location of the cursor
Traceability: FRD 2.15
Priority 1

3.2.2.15.1.1 Pick a point on the screen and then display its coordinates.
Traceability: FRD 2.15
Priority 1

3.2.2.15.1.2 Pick a point on the screen and display the elevation at that point.
Traceability: FRD 2.15
Priority 1

3.2.2.15.1.3 Produce a display of the magnitude of an areas slope.
Traceability: FRD 2.15
Priority 1

3.2.2.15.1.4 Display the angle between a picked line and either true or magnetic north.
Traceability: FRD 2.15
Priority 1

3.2.2.15.1.5 Display the distance and bearing between interactively chosen points.
Traceability: FRD 2.15
Priority 1

3.2.2.15.1.6 Interactively draw a polyline and display the distance and bearing.
Traceability: FRD 2.15
Priority 1

3.2.2.15.2 Coordinate generation will be a continuous operation or an "as-requested" operation
Traceability: FRD 2.15
Priority 1

3.2.2.15.3 As with the positional coordinates, the ground elevation will also be available to the application if there is elevation data underlying the requested position.
Traceability: FRD 2.15
Priority 1

3.2.2.15.4 With all coordinates generated, an associated precision value for the placement of the cursor will be produced based on displayed resolution of the map background (pixel size) and cursor sensitivity.
Traceability: FRD 2.15
Priority 1

3.2.2.15.5 With all coordinates and elevations generated, an associated accuracy value will be created, based on the data used for the position (including precision of cursor placement) or elevation derivation.
Traceability: FRD 2.15
Priority 1

3.2.2.15.5.1 Display the accuracy of the current set of features on the map display.
Traceability: FRD 2.15
Priority 1

3.2.2.15.5.2 Display the Coordinate Precision of a point.
Traceability: FRD 2.15
Priority 1

3.2.2.15.6 Be able to pick any feature or display selected associated attributes
Traceability: FRD 2.15
Priority 1

3.2.2.15.6.1 Allow to pick two points and display an intervisibility profile.
Traceability: FRD 2.15
Priority 1

3.2.2.15.6.2 Allow the application to pick a path on the screen and display an intervisibility profile of the path.
Traceability: FRD 2.15
Priority 1

3.2.2.15.6.3 Set the path coordinates to be used in the intervisibility functions.
Traceability: FRD 2.15
Priority 1

3.2.2.15.6.4 Set the maximum range to be used in the intervisibility functions.
Traceability: FRD 2.15
Priority 1

3.2.2.15.6.5 Be able to link an object within an overlay to database information for the object. If a communication link is represented by a line between station locations, it should be possible to click on the line to view the information in the database.

Traceability: FRD 2.15
Priority 1

3.2.2.15.7 Be able to support cursor pick of any graphic symbol in a map layer and provide the associated object identifier to the application

Traceability: FRD 2.15
Priority 1

3.2.2.16 Have the capability to perform pasteboard editing functions using pointing device.

Traceability: FRD 2.16
Priority 2

3.2.2.16.1 Annotate Pasteboard object.

Traceability: FRD 2.16
Priority 2

3.2.2.16.2 Create a Pasteboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.3 Cut an object.

Traceability: FRD 2.16
Priority 2

3.2.2.16.4 Cut an object and Store in Clipboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.5 Delete an object from the Clipboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.7 Create and Display a Pasteboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.8 Delete the Contents of the Pasteboard

Traceability: FRD 2.16
Priority 2

3.2.2.16.9 Paste an object onto the Pasteboard

Traceability: FRD 2.16
Priority 2

3.2.2.16.10 Restore the Previous Pasteboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.11 Use annotated object in Pasteboard.

Traceability: FRD 2.16
Priority 2

3.2.2.17 Be capable of displaying multiple separate and distinct map windows simultaneously

Traceability: FRD 2.17
Priority 2

3.2.2.17.1 Have the capability of displaying a location in more than one map window simultaneously. When map windows have common areas of coverage, cursor movement in one display will be reflected by a marker in the corresponding window.

Traceability: FRD 2.17
Priority 2

3.2.2.17.2 Interactive functions will take place in only one map window at a time

Traceability: FRD 2.17
Priority 2

3.2.2.17.3 Redraw all visible maps in the display configuration.

Traceability: FRD 2.17
Priority 2

3.2.2.17.4 Update the display to reflect changes made since the defer draw mode was set.

Traceability: FRD 2.17
Priority 2

3.2.2.17.5 Redraw the map with the given scale.

Traceability: FRD 2.17
Priority 2

3.2.2.17.6 Redraw the map with the given position at the center of the map display.

Traceability: FRD 2.17
Priority 2

3.2.2.17.7 Change the area of the screen in which the current map is drawn.

Traceability: FRD 2.17
Priority 2

3.2.2.17.8 Display the current map scale and the position of the map center.

Traceability: FRD 2.17
Priority 2

3.2.2.18 Include the capability for absolute and relative symbol scaling

Traceability: FRD 2.18
Priority 1

3.2.2.18.1 Absolute symbol scaling provides for the same size symbol no matter what zoom and rescaling function is initiated (symbol stays the same size)

Traceability: FRD 2.18
Priority 1

3.2.2.18.2 Relative symbol scaling provides for the symbol to reflect the scale of the zoom and rescaling function (symbol gets larger and smaller)

Traceability: FRD 2.18
Priority 1

3.2.2.19 Support the display of digitized color maps

Traceability: FRD 2.19
Priority 1

3.2.2.19.1 Have capability to display raster map data containing multiple color tables. The application will have the capability to select any one of the color tables that are provided (e.g., CADRG contains 3 color tables).

Traceability: FRD 2.19
Priority 1

3.2.2.19.2 Any map layer or vector feature may be combined with this map background.
Traceability: FRD 2.19
Priority 1

3.2.2.20 Provide the capability to display a terrain profile from elevation data selected from the SDBMS and vertical obstruction data provided in the SDBMS or provided by the application.
Traceability: FRD 2.20
Priority 2

3.2.2.20.1 Profile path will represent a straight line segment, a series of line segments or a linear feature from the cartographic data base
Traceability: FRD 2.20
Priority 2

3.2.2.20.2 Profile display will be labeled both vertically and horizontally
Traceability: FRD 2.20
Priority 2

3.2.2.20.3 Profile display will have a application-selectable vertical exaggeration and horizontal scale
Traceability: FRD 2.20
Priority 2

3.2.2.20.4 Have capability to display LOS with the terrain profile
Traceability: FRD 2.20
Priority 2

3.2.2.20.5 The profile view will display the surface of the earth as the highest elevation within a specified distance to the right and left of the profile baseline.
Traceability: FRD 2.20
Priority 2

3.2.2.20.6 Will mark vertical obstructions provided by the application or selected from the SDBMS within a specified distance to the right and left of the profile baseline.
Traceability: FRD 2.20
Priority 2

3.2.2.21 Provide the capability to display terrain perspective views utilizing elevation data, local geocoded and standard geocoded imagery and any of the features available in the data base. The features and representations are described in 1.9.
Traceability: FRD 2.21
Priority 1

3.2.2.21.1 Produce perspective views of terrain.
Traceability: FRD 2.21
Priority 1

3.2.2.21.2 Produce a Radar Envelope in a perspective window.
Traceability: FRD 2.21
Priority 1

3.2.2.21.3 Application can specify which map layers to drape in a perspective view.
Traceability: FRD 2.21
Priority 1

3.2.2.21.4 Generate contour polylines for specified terrain elevations.
Traceability: FRD 2.21
Priority 1

3.2.2.22 Will display the results of surface analysis for a given AOI.
Traceability: FRD 2.22
Priority 2

3.2.2.22.1 Will allow the display of surface feature coverage and vertical obstructions according to all thematic layers in the database. This includes vegetation, soils, transportation, drainage, slope, industry, and obstacles.
Traceability: FRD 2.22
Priority 2

3.2.2.22.2 Provide an interactive graphics interface and cataloging system to data bases.
Traceability: FRD 2.22
Priority 2

3.2.2.23 Provide an MCG&I data browsing function.
Traceability: FRD 2.23
Priority 2

3.2.2.23.1 Show available on-line and off-line data bases
Traceability: FRD 2.23
Priority 2

3.2.2.23.2 Choose desired input data bases.
Traceability: FRD 2.23
Priority 2

3.2.2.24 Each MCG&I display server provide support for multiple clients in the same window and for sharing of overlays among windows on separate client workstations.
Traceability: FRD 2.24
Priority 1

3.2.2.25 Support hardcopy of any map window or one or more map layers
Traceability: FRD 2.25
Priority 1

3.2.2.25.1 Support selection of a geographic region for hardcopy
Traceability: FRD 2.25
Priority 1

3.2.2.25.1.1 Which is identical to the geographic extent visible within a map window
Traceability: FRD 2.25
Priority 1

3.2.2.25.1.2 Which can be of any extent, regardless of visibility in a map window
Traceability: FRD 2.25
Priority 1

3.2.2.25.2 Support CGM, Postscript, PCL, TIFF, NITFS, JPEG and HP GL
Traceability: FRD 2.25
Priority 1

3.2.2.25.3 Support hardcopy to true scale (same scale as an associated paper map scale).
Traceability: FRD 2.25
Priority 1

3.2.2.25.4 Support hardcopy to a specified or associated projection
Traceability: FRD 2.25
Priority 1

3.2.2.25.5 Support the printing in north-up, track-up, and application other specified orientations
Traceability: FRD 2.25
Priority 1

3.2.2.25.6 Support multi-paged printouts in the case where the hardcopy size is smaller than the geographic region being hardcopied.
Traceability: FRD 2.25
Priority 1

JMTK 3.2.3 Spatial Database Management

3.2.3.1 Will perform data base management functions
Traceability: FRD 3.1
Priority 1

3.2.3.1.1 Have the capability to import and export data sets in their standard format
Traceability: FRD 3.1
Priority 1

3.2.3.1.2 Will accept as input standard MCG&I data products from associated transfer and storage media.
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1 Vector Product Format (VPF) data sets
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1.1 WVS
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1.2 All level of VMAP
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1.3 ITD
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1.4 Urban Vector Map
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1.5 DFLIP
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1.6 Aeronautical Information DATA (AID)
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1.7 Gazetteer (when available)
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.1.8 All other produced VPF data sets conforming to the VPF specification.
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.2 Data sets conforming to the Raster Product Format (RPF), including CADRG and CIB.
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.2.1 CADRG
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.2.2 CIB
Traceability: FRD 3.1
Priority 1

3.2.3.1.2.3 Compressed Digital Terrain Elevation Data (when available).
Traceability: FRD 3.1
Priority 1

3.2.3.1.3 Will accept as input these data sets from their associated storage and distribution media
Traceability: FRD 3.1
Priority 1

3.2.3.1.3.1 DTED
Traceability: FRD 3.1
Priority 1

3.2.3.1.3.2 DAFIF
Traceability: FRD 3.1
Priority 1

3.2.3.1.3.3 ADRG
Traceability: FRD 3.1
Priority 1

3.2.3.1.3.4 Support a run-time "hasty" method for downsampling the 24-bit ADRG colors to fewer than 256 colors.
Traceability: FRD 3.1
Priority 1

3.2.3.1.3.5 Digital Point Positioning Database (Digital PPDB)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4 Will accept these non-maintained data sets from all their associated storage and distribution media.
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.1 Digital feature analysis data (DFAD), levels 1, 1c, 2, 3c
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.2 World vector shoreline (WVS) in Standard Linear Format (SLF)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.3 Digital chart of the world (DCW)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.4 Probabilistic vertical obstruction data (PVOD)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.5 Digitized point positioning data base (Digitized PPDB)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.6 Arc digital raster imagery (ADRI)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.7 Compressed Aeronautical Chart (CAC) (NV)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.8 E-MAP (AR)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.9 DADRG (AR)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.10 Common Mapping Standard (CMS)
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.11 Interim Terrain Data (ITD) and Planning Interim Terrain Data (PITD) in SLF
Traceability: FRD 3.1
Priority 1

3.2.3.1.5 Handle data file formats used by commercial image processing
Traceability: FRD 3.1
Priority 1

3.2.3.1.6 Support elevation data in application-specified resolutions.
Traceability: FRD 3.1
Priority 1

3.2.3.1.7 Store analysis values for such functions as mobility and terrain
Traceability: FRD 3.1
Priority 1

3.2.3.1.7.1 Mobility and terrain
Traceability: FRD 3.1
Priority 1

3.2.3.1.7.2 Store analysis values with metadata including a time and date stamp
Traceability: FRD 3.1
Priority 1

3.2.3.1.8 Save/Store map layers or data in supported formats (e.g., RPF or VPF). The files may represent both raster and vector data.
Traceability: FRD 3.1
Priority 1

3.2.3.1.8.1 Save the state and display configuration of the current map for later use.
Traceability: FRD 3.1
Priority 1

3.2.3.1.8.2 Store Perspective information and image geometry.
Traceability: FRD 3.1
Priority 1

3.2.3.2 Support a data dictionary which includes data definitions for spatial data entities, relationships, and attributes

Traceability: FRD 3.2
Priority 2

3.2.3.2.1 Provide data dictionary values for all supported data formatted data formats and products.

Traceability: FRD 3.2
Priority 2

3.2.3.2.2 Support

Traceability: FRD 3.2
Priority 2

3.2.3.2.2.1 Create

Traceability: FRD 3.2
Priority 2

3.2.3.2.2.2 Update

Traceability: FRD 3.2
Priority 2

3.2.3.2.2.3 Delete

Traceability: FRD 3.2
Priority 2

3.2.3.2.2.4 Report of data in the data dictionary

Traceability: FRD 3.2
Priority 2

3.2.3.3 Store metadata in a format defined by the document TBD.

Traceability: FRD 3.3
Priority 2

3.2.3.4 Support management of source data files for MCG&I data products

Traceability: FRD 3.4
Priority 1

3.2.3.4.1 Copy

Traceability: FRD 3.4
Priority 1

3.2.3.4.2 Rename

Traceability: FRD 3.4
Priority 1

3.2.3.4.3 Move

Traceability: FRD 3.4
Priority 1

3.2.3.4.4 Delete

Traceability: FRD 3.4
Priority 1

3.2.3.4.5 Allow for stacking

Traceability: FRD 3.4
Priority 1

3.2.3.4.6 Allow for subsetting

Traceability: FRD 3.4
Priority 1

3.2.3.4.7 Allow for paneling

Traceability: FRD 3.4
Priority 1

3.2.3.4.8 Allow for integration of geographic data sets.

Traceability: FRD 3.4
Priority 1

3.2.3.4.9 Provide capability to retrieve a list of data base file names.

Traceability: FRD 3.4
Priority 1

3.2.3.4.9.1 Provide a list of both on-line and off-line databases filtered by data base type and scale for text display and output

Traceability: FRD 3.4
Priority 1

3.2.3.4.9.2 Have the capability to read and use DMA digital catalog, Modernized Catalog System (MCS).

Traceability: FRD 3.4
Priority 1

3.2.3.4.9.3 Geographic reference, data base type and scale for text display and output.

Traceability: FRD 3.4
Priority 1

3.2.3.4.9.4 Will allow examining of listing of locally-produced geographic databases, writebacks, and other geographically-referenced scanned material.

Traceability: FRD 3.4
Priority 1

3.2.3.4.10 Provide capability to retrieve (See Paragraph 2.9).

Traceability: FRD 3.4
Priority 1

3.2.3.4.10.1 File size

Traceability: FRD 3.4
Priority 1

3.2.3.4.10.2 File contents

Traceability: FRD 3.4
Priority 1

3.2.3.4.10.3 Data base accuracy

Traceability: FRD 3.4
Priority 1

3.2.3.4.10.4 Other available metadata information such as

Traceability: FRD 3.4
Priority 1

3.2.3.4.10.4.1 Currency date

Traceability: FRD 3.4
Priority 1

3.2.3.4.10.4.2 Resolution

Traceability: FRD 3.4
Priority 1

3.2.3.4.10.4.3 Source datum in accordance with FGDC metadata content standard (FIP PUB TBD)
Traceability: FRD 3.4
Priority 1

3.2.3.4.10.5 The specified data source, accuracy, and scale used to establish the precision of coordinate displays.
Traceability: FRD 3.4
Priority 1

3.2.3.4.11 Provide backup and restore of files to and from removable storage media.
Traceability: FRD 3.4
Priority 1

3.2.3.4.12 Provide a capability to import and export MCG&I files.
Traceability: FRD 3.4
Priority 1

3.2.3.4.12.1 Support interactive transfer of AOI data bases to writable media supported storage
Traceability: FRD 3.4
Priority 1

3.2.3.4.13 Determine if one point is visible at the position of the start point
Traceability: FRD 3.4
Priority 1

3.2.3.5 Store and manage graphical information produced by the JMTK.
Traceability: FRD 3.5
Priority 2

3.2.3.5.1 Store
Traceability: FRD 3.5
Priority 2

3.2.3.5.2 Retrieve
Traceability: FRD 3.5
Priority 2

3.2.3.5.3 Report graphic snapshots of map layers with graphic symbology.
Traceability: FRD 3.5
Priority 2

3.2.3.5.4 Support import and export of graphic data in
Traceability: FRD 3.5
Priority 2

3.2.3.5.4.1 NITF formats
Traceability: FRD 3.5
Priority 2

3.2.3.5.4.2 CGM formats
Traceability: FRD 3.5
Priority 2

3.2.3.5.4.3 TIFF formats
Traceability: FRD 3.5
Priority 2

3.2.3.6 Support projection and datum transformations of all on-line spatial data bases.
Traceability: FRD 3.6
Priority 1

3.2.3.6.1 Polar stereographic

Traceability: FRD 3.6
Priority 1

3.2.3.6.2 Transverse Mercator

Traceability: FRD 3.6
Priority 1

3.2.3.6.3 Lambert conformal

Traceability: FRD 3.6
Priority 1

3.2.3.6.4 Cylindrical equal-distant

Traceability: FRD 3.6
Priority 1

3.2.3.6.5 Equal Arc-Second Raster Chart and Map (ARC)

Traceability: FRD 3.6
Priority 1

3.2.3.6.6 Projection and datum transformations will be based on

Traceability: FRD 3.6
Priority 1

3.2.3.6.6.1 DMA technical manual 8358

Traceability: FRD 3.6
Priority 1

3.2.3.6.6.2 DMA technical report 8350

Traceability: FRD 3.6
Priority 1

3.2.3.6.6.3 USGS professional paper 1395

Traceability: FRD 3.6
Priority 1

3.2.3.6.6.4 Transformation and coordinate conversions between all the datum listed in these three documents will be provided.

Traceability: FRD 3.6
Priority 1

3.2.3.6.7 Transformations will be based on spheroid and datum of input coordinate(s) and desired spheroid and datum of output coordinate(s)

Traceability: FRD 3.6
Priority 1

3.2.3.6.8 A standard list of supported spheroids and datums can be requested and provided.

Traceability: FRD 3.6
Priority 1

3.2.3.7 Support input and storage, query, and retrieval of image and graphics data formatted in the version 1.1 and 2.0 of the National Imagery Transmission Format Standard (NITF).

Traceability: FRD 3.7
Priority 1

3.2.3.7.1 Input

Traceability: FRD 3.7
Priority 1

3.2.3.7.2 Storage

Traceability: FRD 3.7
Priority 1

3.2.3.7.3 Query and retrieval of image

Traceability: FRD 3.7
Priority 1

3.2.3.7.4 Graphics data formatted in the version 1.1 and 2.0 of the National Imagery Transmission Format Standard (NITF)

Traceability: FRD 3.7
Priority 1

3.2.3.8 Support the decompression of input data bases that have been previously compressed.

Traceability: FRD 3.8
Priority 1

3.2.3.8.1 NITF compression schemes

Traceability: FRD 3.8
Priority 1

3.2.3.8.2 Digitized map compression scheme

Traceability: FRD 3.8
Priority 1

3.2.3.8.3 Imagery compression scheme

Traceability: FRD 3.8
Priority 1

3.2.3.9 Support creation of areas-of-interest (AOI) of any size with any combination of available standard input data bases and scales as selected by the application

Traceability: FRD 3.9
Priority 1

3.2.3.10 Support Data Query for the following

Traceability: FRD 3.10
Priority 1

3.2.3.10.1 The visibility of the selected feature.

Traceability: FRD 3.10
Priority 1

3.2.3.10.2 The name of the selected feature.

Traceability: FRD 3.10
Priority 1

3.2.3.10.3 The name of the selected map in the display configuration.

Traceability: FRD 3.10
Priority 1

3.2.3.10.4 The name of the selected overlay.

Traceability: FRD 3.10
Priority 1

3.2.3.10.5 The visibility of the selected map.

Traceability: FRD 3.10
Priority 1

3.2.3.10.6 The visibility of the selected overlay.

Traceability: FRD 3.10
Priority 1

3.2.3.10.7 The area of interest for the selected map.
Traceability: FRD 3.10
Priority 1

3.2.3.10.8 List of the names of the maps associated with the selected display configuration.
Traceability: FRD 3.10
Priority 1

3.2.3.10.9 List of the names of the overlays associated with the selected map.
Traceability: FRD 3.10
Priority 1

3.2.3.10.10 The range of the selected map window to view surface coordinates.
Traceability: FRD 3.10
Priority 1

3.2.3.10.11 The projection type for the selected map.
Traceability: FRD 3.10
Priority 1

3.2.3.10.12 The position of the selected map center.
Traceability: FRD 3.10
Priority 1

3.2.3.10.13 The selected map scale.
Traceability: FRD 3.10
Priority 1

3.2.3.10.14 The range of the selected map window in latitude/longitude coordinates.
Traceability: FRD 3.10
Priority 1

3.2.3.10.15 List of the names of the features associated with the selected overlay.
Traceability: FRD 3.10
Priority 1

3.2.3.10.16 The number of the selected overlay.
Traceability: FRD 3.10
Priority 1

3.2.3.10.17 The color associated with the specified index in the selected feature.
Traceability: FRD 3.10
Priority 1

3.2.3.10.18 The latitude/longitude coordinates of each point of a drawn polygon.
Traceability: FRD 3.10
Priority 1

3.2.3.10.19 The latitude/longitude coordinates of a drawn polyline.
Traceability: FRD 3.10
Priority 1

3.2.3.10.20 The coordinates of a picked point.
Traceability: FRD 3.10
Priority 1

3.2.3.10.21 The two corner points of a drawn rectangle.
Traceability: FRD 3.10
Priority 1

3.2.3.10.22 The distance over terrain between interactively picked points.
Traceability: FRD 3.10
Priority 1

3.2.3.10.23 The selected visibility of the ADRG legend indicated.
Traceability: FRD 3.10
Priority 1

3.2.3.10.24 The visibility of the Coordinate Precision window.
Traceability: FRD 3.10
Priority 1

3.2.3.10.25 The visibility of the coverage legend.
Traceability: FRD 3.10
Priority 1

3.2.3.10.26 The visibility of the map legend.
Traceability: FRD 3.10
Priority 1

3.2.3.10.27 The visibility of the PMP error legend.
Traceability: FRD 3.10
Priority 1

3.2.3.10.28 The map and feature being used for the selected display.
Traceability: FRD 3.10
Priority 1

3.2.3.10.29 The visibility of the selected inset.
Traceability: FRD 3.10
Priority 1

3.2.3.10.30 List of all the maps and features of the selected display configuration.
Traceability: FRD 3.10
Priority 1

3.2.3.10.31 List of the names of the colors in the selected device file.
Traceability: FRD 3.10
Priority 1

3.2.3.10.32 The selected state of the background mode flag.
Traceability: FRD 3.10
Priority 1

3.2.3.10.33 List of the format names in the selected format file.
Traceability: FRD 3.10
Priority 1

3.2.3.10.34 The number of primitives in the selected format.
Traceability: FRD 3.10
Priority 1

3.2.3.10.35 List of the ids of all the objects in the selected feature.
Traceability: FRD 3.10
Priority 1

3.2.3.10.36 The parameters of the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.36.1 The position of the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.36.2 The rotation of the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.36.3 The scale factors of the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.37 The text string for the requested primitive.
Traceability: FRD 3.10
Priority 1

3.2.3.10.38 The visibility of the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.39 The visibility of the selected primitive in the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.40 The data for the specified informational primitive of the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.41 The color for the primitive number within the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.42 The font file pathname for the requested primitive.
Traceability: FRD 3.10
Priority 1

3.2.3.10.43 The position for the named primitive.
Traceability: FRD 3.10
Priority 1

3.2.3.10.44 The style attributes for the specified primitive.
Traceability: FRD 3.10
Priority 1

3.2.3.10.45 The type of the given primitive in the selected format.
Traceability: FRD 3.10
Priority 1

3.2.3.10.46 The visibility of the track history of the specified object if the history is on.
Traceability: FRD 3.10
Priority 1

3.2.3.10.47 The pick value for the selected feature.
Traceability: FRD 3.10
Priority 1

3.2.3.10.48 The pick value for the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.49 The selected value of the pickability flag for the selected feature.
Traceability: FRD 3.10
Priority 1

3.2.3.10.50 The selected pick center in screen pixel coordinates.
Traceability: FRD 3.10
Priority 1

3.2.3.10.51 The selected pick radius in units of pixels.
Traceability: FRD 3.10
Priority 1

3.2.3.10.52 The selected value of the pick threshold.
Traceability: FRD 3.10
Priority 1

3.2.3.10.53 List of pickable objects for the selected feature.
Traceability: FRD 3.10
Priority 1

3.2.3.10.54 List of objects within a polygon that qualify for a pick.
Traceability: FRD 3.10
Priority 1

3.2.3.10.55 Whether the specified object is highlighted, and the highlight color.
Traceability: FRD 3.10
Priority 1

3.2.3.10.56 List of the ids of all the object links.
Traceability: FRD 3.10
Priority 1

3.2.3.10.57 Information about the specified link.
Traceability: FRD 3.10
Priority 1

3.2.3.10.58 The selected visibility of an object link.
Traceability: FRD 3.10
Priority 1

3.2.3.10.59 The radar parameters used specifically by the Radar Target Detection function.
Traceability: FRD 3.10
Priority 1

3.2.3.10.60 The radar parameters for a specified radar.
Traceability: FRD 3.10
Priority 1

3.2.3.10.61 The line-of-sight distance and visibility from one point to another.
Traceability: FRD 3.10
Priority 1

3.2.3.10.62 The earth type used to generate a terrain mask. Query Terrain Masks.
Traceability: FRD 3.10
Priority 1

3.2.3.10.63 The angle off true or magnetic north for two interactively picked points.
Traceability: FRD 3.10
Priority 1

3.2.3.10.64 The terrain elevation of an interactively picked point.
Traceability: FRD 3.10
Priority 1

3.2.3.10.65 The coordinates of an interactively picked point.
Traceability: FRD 3.10
Priority 1

3.2.3.10.66 List of minimum and maximum elevations within a given AOI.
Traceability: FRD 3.10
Priority 1

3.2.3.10.67 The vehicle parameters for a specified vehicle.
Traceability: FRD 3.10
Priority 1

3.2.3.10.68 The distance along a three-dimensional air path.
Traceability: FRD 3.10
Priority 1

3.2.3.10.69 The distance along a ground path.
Traceability: FRD 3.10
Priority 1

3.2.3.10.70 The distance between two positions.
Traceability: FRD 3.10
Priority 1

3.2.3.10.71 The position of the light source of a relief shade.
Traceability: FRD 3.10
Priority 1

3.2.3.10.72 The value from a data base grid corresponding to a given map coordinate.
Traceability: FRD 3.10
Priority 1

3.2.3.10.73 The bearing between two positions.
Traceability: FRD 3.10
Priority 1

3.2.3.10.74 The elevation of the given world coordinate position.
Traceability: FRD 3.10
Priority 1

3.2.3.10.75 Selected display precision settings.
Traceability: FRD 3.10
Priority 1

3.2.3.10.76 The great circle distance between two interactively picked points.
Traceability: FRD 3.10
Priority 1

3.2.3.10.77 The distance between interactively picked points.
Traceability: FRD 3.10
Priority 1

3.2.3.10.78 The visibility of the map accuracy legend.
Traceability: FRD 3.10
Priority 1

3.2.3.10.79 The ASCII version of a double floating point number to a given precision.
Traceability: FRD 3.10
Priority 1

3.2.3.10.80 The ASCII version of a floating point number to a given precision.
Traceability: FRD 3.10
Priority 1

3.2.3.10.81 Load a new fill pattern.
Traceability: FRD 3.10
Priority 1

3.2.3.10.82 Elevation accuracy data for a given lat/long
Traceability: FRD 3.10
Priority 1

3.2.3.10.83 Provide a capability to query based on region, data or product type, features, classes, and attributes.
Traceability: FRD 3.10
Priority 1

3.2.3.10.84 Queries with a location and a proximity range
Traceability: FRD 3.10
Priority 1

3.2.3.10.85 Containment queries
Traceability: FRD 3.10
Priority 1

3.2.3.10.86 Adjacency queries
Traceability: FRD 3.10
Priority 1

3.2.3.10.87 Spatial metric queries (length, area, distance, azimuth)
Traceability: FRD 3.10
Priority 1

3.2.3.10.88 Boolean combination of queries
Traceability: FRD 3.10
Priority 1

3.2.3.11 Will perform matrix merging of similar matrix features from the database.
Traceability: FRD 3.11
Priority 2

3.2.3.12 Coordinate conversion will be supported among the following coordinate, and will comply with DMA TM-8358
Traceability: FRD 3.12
Priority 1

3.2.3.13 Store metadata in a format defined by document TBD.
Traceability: FRD 3.13
Priority 3

3.2.3.14 Support Digital Chart Update (DCHUM) display and management.
Traceability: FRD 3.14
Priority 2

JMTK 3.2.4 Local Imagery Preprocessing

3.2.4.1 Will assess the presence and accuracy of ancillary control information of local imagery
Traceability: FRD 4.1
Priority 2

3.2.4.1.1 Convert various types of control information to common equivalent values
Traceability: FRD 4.1
Priority 2

3.2.4.1.2 Process accuracy descriptions to common standard evaluations (90% absolute, relative, CE, LE & SE)
Traceability: FRD 4.1
Priority 2

3.2.4.1.3 Determine acceptability and completeness of data for geocoding process
Traceability: FRD 4.1
Priority 2

3.2.4.2 Will register and either control or re-control local imagery to geographic coordinates for geocoding
Traceability: FRD 4.2
Priority 2

3.2.4.2.1 Mensurate ADRI to provide precise monoscopic positioning coordinate of control point
Traceability: FRD 4.2
Priority 2

3.2.4.2.2 Mensurate conjugate point in local image
Traceability: FRD 4.2
Priority 2

3.2.4.2.3 Calculate and evaluate polynomial transform of entire local image to ADRI space. Re-mensurate imageries and re-evaluate transform to achieve appropriate level of accuracy
Traceability: FRD 4.2
Priority 2

3.2.4.2.4 Accept computation of controlling data and store for geocoding process
Traceability: FRD 4.2
Priority 2

3.2.4.3 Will utilize derived or input control information and DTED to resample imagery to geocoded format
Traceability: FRD 4.3
Priority 2

3.2.4.3.1 Perform resampling to transform input local imagery to a universal equal arc-second projection system (ADRI projection).
Traceability: FRD 4.3
Priority 2

3.2.4.3.2 Perform image tiling or tessellation to place imagery in standard format.
Traceability: FRD 4.3
Priority 2

3.2.4.3.3 Create additional geocoded imagery scales as necessary to retain resolution or avoid replication of imagery.
Traceability: FRD 4.3
Priority 2

3.2.4.4 Will process and store local imagery as either geocoded or ungeocoded local imagery.
Traceability: FRD 4.4
Priority 2

3.2.4.4.1 Ungeocoded imagery may or may not be compressed before storage, at operator discretion.
Traceability: FRD 4.4
Priority 2

3.2.4.4.2 All geocoded imageries will be compressed.
Traceability: FRD 4.4
Priority 2

3.2.4.4.3 Store as separate (overlay capable) file on locally-controlled non-permanent storage.
Traceability: FRD 4.4
Priority 2

3.2.4.4.4 Retain imagery blocking to facilitate random access retrieval of blocks when stored.
Traceability: FRD 4.4
Priority 2

3.2.4.4.5 Use only the specified image compression method. Scan maps and imagery and convert to RPF formats
Traceability: FRD 4.4
Priority 2

3.2.4.5 Will perform precise monoscopic positioning based upon local geocoded imageries.
Traceability: FRD 4.5
Priority 3

3.2.4.5.1 Derive positional coordinates of selected points mensurated on local geocoded imagery.
Traceability: FRD 4.5
Priority 3

3.2.4.5.2 Overlay geocoded local imagery directly over standard imagery. Permit imagery of different scales to be merged retaining best quality data value
Traceability: FRD 4.5
Priority 3

3.2.4.5.3 Calculate absolute error of point positions at 90% CE, LE and SE from contributors:
Traceability: FRD 4.5
Priority 3

3.2.4.5.3.1 Elevation data
Traceability: FRD 4.5
Priority 3

3.2.4.5.3.2 Local geocoded imagery
Traceability: FRD 4.5
Priority 3

3.2.4.5.3.3 Display scale
Traceability: FRD 4.5
Priority 3

3.2.4.5.3.4 Cursor position
Traceability: FRD 4.5
Priority 3

3.2.4.6 Will perform point transfer positioning from uncontrolled imageries to:
Traceability: FRD 4.6
Priority 3

3.2.4.6.1 ADRI standard imagery

Traceability: FRD 4.6
Priority 3

3.2.4.6.2 CIB data

Traceability: FRD 4.6
Priority 3

3.2.4.6.3 Generate pairs of conjugate point coordinates from uncontrolled local imagery and geocoded imageries via operator selection which surround area and points of interest. See Note 3.

Traceability: FRD 4.6
Priority 3

3.2.4.6.4 Evaluate computed transform at points and area of interest for accuracy (relative and absolute)

Traceability: FRD 4.6
Priority 3

3.2.4.6.5 Derive positional coordinates of points of interest mensurated on uncontrolled image.

Traceability: FRD 4.6
Priority 3

3.2.4.6.6 Calculate absolute error of point positions at 90% CE, LE and SE from contributors:

Traceability: FRD 4.6
Priority 3

3.2.4.6.6.1 Elevation data

Traceability: FRD 4.6
Priority 3

3.2.4.6.6.2 ADRI Standard Imagery

Traceability: FRD 4.6
Priority 3

3.2.4.6.6.3 CIB data

Traceability: FRD 4.6
Priority 3

3.2.4.6.6.4 Displayed scale

Traceability: FRD 4.6
Priority 3

3.2.4.6.6.5 Cursor Precision

Traceability: FRD 4.6
Priority 3

3.2.4.6.6.6 Point transfer polynomial

Traceability: FRD 4.6
Priority 3

3.2.4.6.7 Have the capability to produce National Imagery Transmission Formatted (NITF) data from uncontrolled local imagery.

Traceability: FRD 4.6
Priority 3

3.2.4.7 Image enhancement will be available to improve the quality of displayed imagery (e.g., contrast stretching, etc.).

Traceability: FRD 4.7
Priority 3

3.2.4.7.1 Apply automated Linear Contrast Enhancement.
Traceability: FRD 4.7
Priority 3

3.2.4.7.2 Apply average CDF (Ramp CDF) Contrast Enhancement.
Traceability: FRD 4.7
Priority 3

3.2.4.7.3 Apply brightness (Contrast Enhancement).
Traceability: FRD 4.7
Priority 3

3.2.4.7.4 Apply the Canny Edge Detector.
Traceability: FRD 4.7
Priority 3

3.2.4.7.5 Apply a linear contrast enhancement to an image.
Traceability: FRD 4.7
Priority 3

3.2.4.7.6 Apply difference of Gaussian filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.7 Apply an edge sharpening filter to an image.
Traceability: FRD 4.7
Priority 3

3.2.4.7.8 Apply an area edge filter to an image.
Traceability: FRD 4.7
Priority 3

3.2.4.7.9 Apply a point edge filter to an image.
Traceability: FRD 4.7
Priority 3

3.2.4.7.10 Apply an edge preserving smoothing filter to an image.
Traceability: FRD 4.7
Priority 3

3.2.4.7.11 Apply Gaussian curve point edge detector to the image.
Traceability: FRD 4.7
Priority 3

3.2.4.7.12 Apply Gaussian filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.13 Apply Automated Linear Contrast Enhancement.
Traceability: FRD 4.7
Priority 3

3.2.4.7.14 Apply High Pass Average filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.15 Apply High Pass Median filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.16 Apply an edge preserving smoothing filter to an image.
Traceability: FRD 4.7
Priority 3

3.2.4.7.17 Apply Laplacian #1 convolution filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.18 Apply Laplacian #3 convolution filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.19 Apply Laplacian #2 convolution filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.20 Apply Manual Linear Contrast Enhancement.
Traceability: FRD 4.7
Priority 3

3.2.4.7.21 Apply maximum filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.22 Apply minimum filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.23 Apply Noise Reduction Modal.
Traceability: FRD 4.7
Priority 3

3.2.4.7.24 Apply Noise Reduction Outlier Removal filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.25 Apply Pavlidis Local Average Contrast Enhancement.
Traceability: FRD 4.7
Priority 3

3.2.4.7.26 Apply Pavlidis Random CDF Contrast Enhancement.
Traceability: FRD 4.7
Priority 3

3.2.4.7.27 Apply Piecewize Linear Contrast Enhancement.
Traceability: FRD 4.7
Priority 3

3.2.4.7.28 Apply Prewitt Horizontal Edge Detection filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.29 Apply Prewitt Horizontal & Vertical Edge Detection filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.30 Apply Prewitt Vertical Edge Detection filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.31 Apply Reverse Video image filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.32 Apply Smoothing Average filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.33 Apply Smoothing Median filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.34 Apply Sobel Horizontal Edge Detection filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.35 Apply Sobel Horizontal & Vertical filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.36 Apply Threshold above value filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.37 Apply Threshold below value filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.38 Apply Threshold between value filter.
Traceability: FRD 4.7
Priority 3

3.2.4.7.39 Perform image Tiepoint Analysis.
Traceability: FRD 4.7
Priority 3

3.2.4.7.40 Perform Image Registration.
Traceability: FRD 4.7
Priority 3

3.2.4.8 Provide rudimentary and basic image processing functions.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1 Image enhancement will be available to perform contrast stretching on imagery.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.1 Rasterize area feature into grid.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.2 Rasterize line feature into grid.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.3 Rasterize point feature into grid.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.4 Display Area Gradient raster output.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.5 Change the visibility of the current map.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.6 Change a features visibility.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.7 Change the visibility of the current overlay.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.8 Convert a 24 bit image to an 8 bit image, then displays it in a dynamic window.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.9 Convert a 24 bit image to an 8 bit image, then displays it in a widget.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.10 Fade the previously initialized feature by the percent indicated.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.11 Restore faded feature to its original color.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.12 Generate Fast Perspective as an 8 bit image.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.13 Generate a Radar Envelope over a Perspective view as a 24 bit image.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.14 Interactively select and extracts an area of a screen image.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.15 Generate FLIR return as an 8 bit image.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.16 Generate LLLTV return as an 8 bit image.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.17 Generate Radar return as a 8 bit image.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.18 Generate Synthetic Aperture Radar (SAR) and make available as an 8 bit image.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.19 Map a 24-bit image to color colormap indices.
Traceability: FRD 4.8
Priority 2

3.2.4.8.1.20 Map an 8-bit image to gray scale colormap indices.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2 Rotation of the map windows, including all map layers, will be provided.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.1 Allow the interactive acceptance or rejection of the generated object filter.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.2 Display an 8-bit image in a scrolled window.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.3 Create a gray scale colormap.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.4 Apply and plot an area edge filter to the designated image area.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.5 Apply and plot an equal probability quantified filter to the designated image area.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.6 Apply and plot a floating point smoothing filter to the designated image area.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.7 Apply and plot an integer smoothing filter to the designated image area.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.8 Apply and plot a point edge detection filter to the designated image area.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.9 Apply and plot a Sobel filter to the designated image area.
Traceability: FRD 4.8
Priority 2

3.2.4.8.2.10 Apply and plot an edge sharpening filter to the designated image area.
Traceability: FRD 4.8
Priority 2

3.2.5 Requirements Submitted by the Army

3.2.5.1 MCG&I shall provide an interface to COTS software necessary for applications to utilize the following DBMS capabilities:

3.2.5.1.1 Ad hoc (i.e., relational, spatial, and combined) database queries.
Traceability: ARMY, 20 July 1996
Priority ???

3.2.5.2 MCG&I shall provide the capability for an application to select a feature(s) from a map by its type and geographic location according to the following rules:

3.2.5.2.1 If one feature exists at the geographic location, then that feature is selected.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.5.3 MCG&I shall provide the capability to perform, at the request of an application program, comparisons of elevation data that result in the following products which can be passed to the application program:

1. Target acquisition

Traceability: ARMY, 20 July 1996
Priority ???

2. Multiple site target acquisition

Traceability: ARMY, 20 July 1996
Priority ???

3.2.5.4 FAAD C2 systems requires the ability to create, display, and delete sensor (Ground Based Sensor and Light and Special Division Interim Sensor) terrain coverage overlays at various flight altitudes above ground level. Create implies the need to specify the parameters.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.5.5 FAAD C2 CRTD software requires support for a shot opportunity map overlay for a specific laydown of sensors and weapons.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.5.6 FAAD C2 systems requires the ability to display FAAD fire unit responsibility coverage zones.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.5.7 FAAD requires the ability to generate a map background from multiple DMA ADRG CD ROM media. The multiple media requirement implies the ability to generate a seamless map background from more than one CD ROM.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.6 Requirements Submitted by the Marines

3.2.6.1 Communications Services shall support the Front Line of Own Troops line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.2 Communications Services shall support the Obstacle line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.3 Communications Services shall support the Fortified line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.4 Communications Services shall support the Reconnaissance line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.5 Communications Services shall support the Route line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.6 Communications Services shall support the Bridge line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.7 Communications Services shall support the Delaying Action line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.8 Communications Services shall support the Lane/Path line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.9 Communications Services shall support the Ferry line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.10 Communications Services shall support theAntitank Ditch line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.11 Communications Services shall support the Antipersonnel Mine line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.12 Communications Services shall support the Antitank Mine line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.13 Communications Services shall support the Antitank Mine with Antihandling Device line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.14 Communications Services shall support the Unspecified Mine line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.15 Communications Services shall support the Boundary line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.16 Communications Services shall support the Phase Line line type, as defined in FM 101-5-1..
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.17 Communications Services shall support the Antipersonnel Mine area fill type, using basic symbols defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.18 Communications Services shall support the Antitank Mine fill type, using basic symbols defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.19 Communications Services shall support the Antitank Mine with Antihandling Device fill type, using basic symbols defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.20 Communications Services shall support Unspecified Mine fill type, using basic symbols defined in FM 101-5-1.
Traceability: JMCIS Overlays
FDD 3.1
Priority ???

3.2.6.21 Communications Services shall provide user interface to specify two Unique Designations for Boundary Lines in overlays.
Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.22 Communications Services shall provide user interface to specify a Size Indicator for Boundary Lines in overlays.
Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.23 Communications Services shall support Section/Squad (12) size indicator in overlays.
Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.24 Communications Services shall support Platoon/Detachment (36) size indicator in overlays.
Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.25 Communications Services shall support Company/Battery/Troop (150-200) size indicator in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.26 Communications Services shall support Battalion/Squadron (450-1000) size indicator in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.27 Communications Services shall support Group/Regiment (1500-3000) size indicator in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.28 Communications Services shall support Brigade (5000-7000) size indicator in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.29 Communications Services shall support Division (15000-21000) size indicator in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.30 Communications Services shall support Corps (45000-60000) size indicator in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.31 Communications Services shall support Army (105000-180000) size indicator in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.32 Communications Services shall automatically display the two Unique Designations and size indicator with the appropriate symbol against the geographic map

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.33 Communications Services shall provide user interface to specify assigned letters for Phase Lines in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.34 Communications Services shall provide user interface to specify numbers for Phase Lines in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.35 Communications Services shall provide user interface to specify code names for Phase Lines in overlays.

Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.36 Communications Services shall automatically display the assigned letters, numbers, and code names for Phase Lines with the appropriate symbol against the geographic map.
Traceability: JMCIS Overlays
FDD 3.2
Priority ???

3.2.6.37 Communications Services shall provide user interface to graphically specify ground axis of advance.
Traceability: JMCIS Overlays
FDD 3.3
Priority ???

3.2.6.38 Communications Services shall provide user interface to graphically specify air axis of advance.
Traceability: JMCIS Overlays
FDD 3.3
Priority ???

3.2.6.38 Communications Services shall provide user interface to graphically specify air axis of advance.
Traceability: JMCIS Overlays
FDD 3.3
Priority ???

MP 3.2 Message Processing Functional Requirements

MP 3.2.1 Message Inbound Processing

Inbound processing consist of receiving message packets from the communications front end, routing of the message for proper processing, validation, parsing, checking for SRI satisfaction, information labeling, and handing off data to an external process/COE module for further processing. A flow chart depicting the association of these processes can be seen in Figure 1.

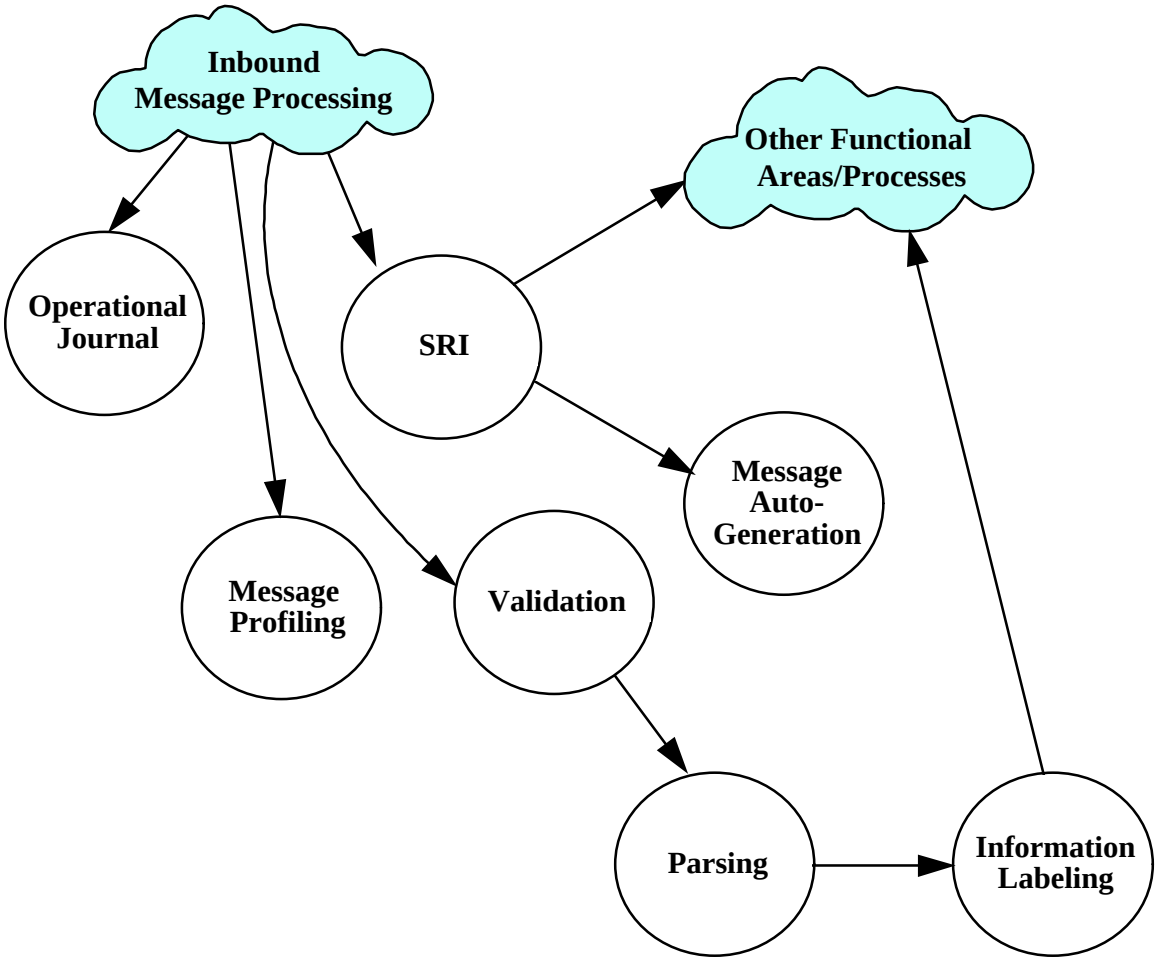

Figure 1. Message Inbound Processing

MP 3.2.1.1 Internal Routing

The message processor shall be capable of accepting data from the communications processing functional area and routing the data to various areas, based on processing requirements. Routing shall be to:

Traceability:
Priority ???

- Operational Journal

Traceability:
Priority ???

- Parser

Traceability:
Priority ???

- Profiler

Traceability:
Priority ???

- SRI processing

Traceability:
Priority ???

- User Interface for error processing

Traceability:
Priority ???

To support routing of data to the appropriate module(s) the message processor shall:
Traceability:
Priority ???

3.2.1.1.1 Provide the capability to extract office symbols from received message headers and route the message to the appropriate destination queue.
Traceability:
Priority ???

3.2.1.1.2 Provide the capability to route based on action addressees
Traceability:
Priority ???

3.2.1.1.3 Provide the capability to route based on information addressees
Traceability:
Priority ???

3.2.1.1.4 Provide the capability to route based on Address Information Group (AIG) routers
Traceability:
Priority ???

3.2.1.1.5 Route to automatic message generation or forwarder based upon user defined criteria (SRI) which may be satisfied through:
Traceability:
Priority ???

a. message content
Traceability:
Priority ???

b. message type
Traceability:
Priority ???

c. message originator
Traceability:
Priority ???

d. message classification
Traceability:
Priority ???

e. message precedence
Traceability:
Priority ???

3.2.1.1.6 Provide the capability to forward received messages to addresses on a secondary distribution list which shall be user definable and maintainable.
Traceability:
Priority ???

3.2.1.1.7 Support routing of messages from a file or application to:
Traceability:
Priority ???

a. a secondary storage media

Traceability:
Priority ???

b. an output device (i.e.; tape, printer, etc.)

Traceability:
Priority ???

3.2.1.1.8 Provide the capability to deliver received messages to an address contained in the router table (i.e.: an individual, a group (role), a database, or an application).

Traceability:
Priority ???

3.2.1.1.9 Provide the capability to transfer received messages to their destination (individual, role, database, or application) in order of precedence

Traceability:
Priority ???

3.2.1.1.10 Provide the capability to transfer received messages to their destination (individual, role, database, or application) in order of arrival, FIFO

Traceability:
Priority ???

3.2.1.1.11 Provide the capability to transfer received messages to their destination (individual, role, database, or application) in reverse order of arrival Last In First Out (LIFO).

Traceability:
Priority ???

3.2.1.1.12 Provide the capability to route to designated user for interactive processing upon:

Traceability:
Priority ???

a. Message having identified errors

Traceability:
Priority ???

b. Message being identified as an incomplete sectioned message

Traceability:
Priority ???

c. Message being identified as a textual message

Traceability:
Priority ???

d. Message identified for manual processing

Traceability:
Priority ???

MP 3.2.1.2 Message Parser

The message processing module shall provide users and authorized processes the capability to extract data from a message. The message processing module shall:

Traceability:
Priority ???

3.2.1.2.1 Provide the capability to specify the information to be extracted from a message.

Traceability:
Priority ???

3.2.1.2.2 Provide the ability to locally change the configuration for data extraction requirements of users and authorized processes without affecting data extraction requirements of other users or processes.

Traceability:
Priority ???

3.2.1.2.3 Restrict ability to modify extraction requirements to authorized users, only.

Traceability:
Priority ???

3.2.1.2.4 Identify the presence of validation errors in messages when delivering extracted information to users and to authorized processes.

Traceability:
Priority ???

3.2.1.2.5 Not impose arbitrary restrictions on the quantity of data extracted from a message.

Traceability:
Priority ???

3.2.1.2.6 Deliver received messages in whole or part to files, processes, and databases.

Traceability:
Priority ???

3.2.1.2.7 Parse, in addition to those referenced in paragraph 2.1.2 all message standards that can be translated into a format compatible with the USMTF CDBS

Traceability:
Priority ???

3.2.1.2.8 Identify a message as requiring manual processing if any of the following conditions are true:

Traceability:
Priority ???

a. The message contains detected, uncorrectable errors

Traceability:
Priority ???

b. The message is a free text message

Traceability:
Priority ???

c. The message type has been designated for manual processing

Traceability:
Priority ???

3.2.1.2.9 Protect against parsing the same message twice even though the message may be received from the communications module on multiple occasions.

Traceability:
Priority ???

3.2.1.2.10 Be capable of identifying a message as requiring interactive correction.

Traceability:
Priority ???

3.2.1.2.11 Make clearly visible invalid entries when presented to a user for action.

Traceability:
Priority ???

3.2.1.2.12 Provide interactive and/or on-line help data specifying valid entries and/or format.

Traceability:
Priority ???

3.2.1.2.13 Support submission of corrected messages for parsing.
Traceability:
Priority ???

3.2.1.2.14 Check and validate for operational or exercise message.
Traceability:
Priority ???

3.2.1.2.15 Provide the capability to selectively expedite the processing of a message in accordance with it's assigned precedence. Rank order of precedence is:
Traceability:
Priority ???

a. Emergency Command Precedence (ECP)
Traceability:
Priority ???

b. Flash
Traceability:
Priority ???

c. Immediate
Traceability:
Priority ???

d. Priority
Traceability:
Priority ???

e. Routine
Traceability:
Priority ???

3.2.1.2.16 Provide the capability for queuing of messages for parsing by precedence.
Traceability:
Priority ???

3.2.1.2.17 Provide the capability for retrieval of messages by precedence.
Traceability:
Priority ???

3.2.1.2.18 Protect data integrity through use of persistent queuing.
Traceability:
Priority ???

3.2.1.2.19 Protect data integrity through use of cyclic redundancy checking (CRC) or like methodology.
Traceability:
Priority ???

3.2.1.2.20 Provide interface to define data extraction criteria.
Traceability:
Priority ???

3.2.1.2.21 Provide interface to edit data extraction criteria.
Traceability:
Priority ???

3.2.1.2.22 Provide interface to activate a data extraction criteria.
Traceability:
Priority ???

3.2.1.2.23 Provide interface to de-activate a data extraction criteria.
Traceability:
Priority ???

3.2.1.2.24 Route parsing results to addresses which are user definable.
Traceability:
Priority ???

3.2.1.2.25 Access data recipient address(s) in a table definable by the system administrator.
Traceability:
Priority ???

3.2.1.2.26 Access data recipient address(s) in a table maintainable by the system administrator.
Traceability:
Priority ???

MP 3.2.1.3 Information Labeling

For systems operating at the system high mode of operations, the message processor shall support the auto input of an information label at the system high water mark, as required by the following extract from DoD 5200.28-STD which states “System high security mode - The mode of operation in which system hardware/software is only trusted to provide need-to-know protection between users. In this mode, the entire system, to include all components electrically and/or physically connected, must operate with security measures commensurate with the highest classification and sensitivity of the information being processed and/or stored. All system users in this environment must possess clearances and authorizations for all information contained in the system. All system output must be clearly marked with the highest classification and all system caveats, until the information has been reviewed manually by an authorized individual to ensure appropriate classifications and caveats have been affixed.” Records created by the parser shall be annotated with an information label commensurate with the level of classification associated with the parsed message (legal classifications are contained in DIAM 65-19). The message processor shall:

3.2.1.3.1 For system high systems, attach an information label to each exported data record equal to the system high water mark. Messages received which are classified less than the system high water mark will be checked for legality and considered legal if the classification marking is equal to or subordinate to the system high water mark.
Traceability:
Priority ???

3.2.1.3.2 For multiple levels of security (MLS) systems the information label must be equal to or subordinate to the system high water mark of the system. Messages received which are classified less than the system high water mark will be checked for legality and considered legal if the classification marking is equal to or subordinate to the system high water mark. Records created from messages under this requirement shall be labeled according to the classification marking of the incoming data.
Traceability:
Priority ???

3.2.1.3.3 User modification of security classification (modification of the classification marking must be monitored and reported to system audit trail).
Traceability:
Priority ???

3.2.1.3.4 Legal information labels shall be created based upon hierarchical classifications
Traceability:
Priority ???

3.2.1.3.5 Legal information labels shall be created based upon hierarchical plus non-hierarchical classifications

Traceability:
Priority ???

MP 3.2.1.4 SRI Processing

Standing Request for Information (SRI) processing is the process of monitoring incoming messages to detect if they contain information of interest to a user or process. Definition of desired information is termed a “criteria” and is user definable and maintainable. The SRI process shall:

3.2.1.4.1 Provide the capability to initiate local message-based SRIs.

Traceability:
Priority ???

3.2.1.4.2 Provide the capability to initiate remote message-based SRIs.

Traceability:
Priority ???

3.2.1.4.3 Provide the capability to define the activation conditions for message-based SRIs.

Traceability:
Priority ???

3.2.1.4.4 Provide the capability to terminate all message-based SRIs managed by an application program with a single action.

Traceability:
Priority ???

3.2.1.4.5 Provide the capability for an application to terminate locally message-based SRIs unconditionally.

Traceability:
Priority ???

3.2.1.4.6 Provide the capability for an application to terminate remote message-based SRIs unconditionally.

Traceability:
Priority ???

3.2.1.4.7 Provide the capability to terminate a message-based SRI after one activation.

Traceability:
Priority ???

3.2.1.4.8 Provide the capability to identify all active message-based SRIs (local and remote) to an application.

Traceability:
Priority ???

3.2.1.4.9 Provide the capability to transfer active message-based SRIs to on-line, non-volatile storage during normal W/S termination.

Traceability:
Priority ???

3.2.1.4.10 Provide the capability to restore active message-based SRIs during W/S initialization.

Traceability:
Priority ???

3.2.1.4.11 Provide the capability to monitor incoming messages for the satisfaction of message-based SRI conditions.

Traceability:
Priority ???

3.2.1.4.12 Provide the capability to initiate the required message-based SRI processing

Traceability:
Priority ???

3.2.1.4.13 Provide the capability to notify a local application upon the satisfaction of a message-based SRI.

Traceability:
Priority ???

3.2.1.4.14 Provide the capability to notify a remote application upon the satisfaction of a message-based SRI.

Traceability:
Priority ???

3.2.1.4.15 Provide the capability to route data satisfying a SRI to a specified user or process. Specific users are:

Traceability:
Priority ???

a. Alerts

Traceability:
Priority ???

b. Auto message generation

Traceability:
Priority ???

c. Specified DBMS

Traceability:
Priority ???

d. Specified user

Traceability:
Priority ???

e. Process

Traceability:
Priority ???

MP 3.2.1.5 Message Profiling

Messages entering the message processing module must be processed to identify and/or extract (copy or demarcate) message elements. Elements extracted from messages are necessary for construction of corresponding message summaries which shall provide “two-level” message review capabilities required for distribution, coordination, and retrieval functions used during search and retrieval processes. The message processing module shall:

3.2.1.5.1 Provide the capability to enter message selection profiles for individual users, group of users, or processes.

Traceability:
Priority ???

3.2.1.5.2 Support distribution criteria to include message routing criteria or message content.
Traceability:
Priority ???

3.2.1.5.3 Compare messages and system profiles to determine which accounts should receive a copy of the associated message summaries.
Traceability:
Priority ???

3.2.1.5.4 Compare messages and system profiles to determine which accounts should receive a copy of the associated parsed data.
Traceability:
Priority ???

3.2.1.5.5 Determine from user profiles and message content which organization is assigned Action for the Office of Primary Interest (ACT/PI) for a given message.
Traceability:
Priority ???

3.2.1.5.6 Determine from user profiles and message content which account shall be designated the Action Officer (AO) for the message.
Traceability:
Priority ???

3.2.1.5.7 Provide an optional capability to distribute message summaries of transmitted messages (come-back copies) to any combination of accounts listed in the internal distribution fields (drafter, coordinators, releaser).
Traceability:
Priority ???

3.2.1.5.8 Provide an optional capability to distribute message come-back copies to any combination of accounts listed in the internal distribution fields (drafter, coordinators, releaser).
Traceability:
Priority ???

3.2.1.5.9 Support user re-addressal of received messages for retransmission to external organizations.
Traceability:
Priority ???

3.2.1.5.10 To support generation of a message profile the message processor shall:
Traceability:
Priority ???

a. Extract the following precedence markings (on messages so marked):
- EMERGENCY COMMAND PRECEDENCE (ECP)
Traceability:
Priority ???
- FLASH
Traceability:
Priority ???
- IMMEDIATE
Traceability:
Priority ???
- PRIORITY
Traceability:
Priority ???

- ROUTINE

Traceability:
Priority ???

b. Process the message to identify and extract the following message elements:
   - Subject/Message ID

Traceability:
Priority ???

   - Date-Time-Group (DTG)

Traceability:
Priority ???

   - Message Addresses (both action and information)

Traceability:
Priority ???

   - Office Symbols (including multiple office symbols in a single address)

Traceability:
Priority ???

   - Message Originator

Traceability:
Priority ???

c. Extract U.S. classification and caveat markings including, but not limited to: TOP SECRET, SECRET, CONFIDENTIAL, UNCLAS EFTO FOUO, UNCLAS EFTO, and UNCLAS.

Traceability:
Priority ???

d. Identify message handling markings for control functions used to enforce user "need-to-know" access within the various classification and caveat levels including, but not limited to: LIMDIS, NOFORN (or NFD), RESDAT, FORMERLY RESDAT (in all formats: FRD, etc.), EYES ONLY (and who for), PERSONAL FOR (and who the message is personal for), SPECAT, SPECAT EXCLUSIVE, and specified, special compartmental caveats as may be modified by the user.

Traceability:
Priority ???

MP 3.2.2 Message Outbound Processing

Outbound processing consist of message generation, data validation, routing, release coordination, and handing off data to an external process/COE module for further processing. A flow chart depicting the association of these processes can be seen in Figure 2.

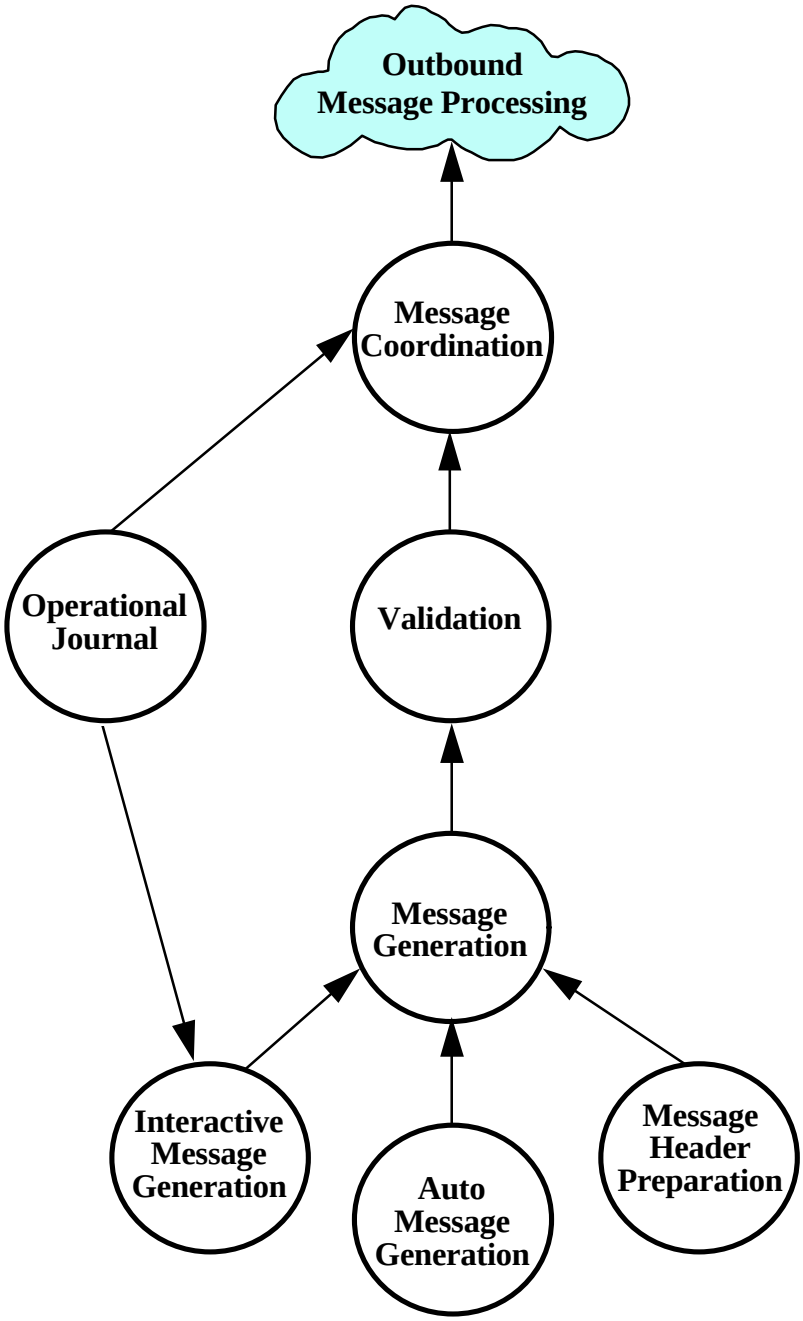

Figure 2. Message Outbound Processing

MP 3.2.2.1 Message Generation

The message processing module must support generation of messages, regardless of the origin of the standard, as long as the message definition provided is in conformance with the USMTF CDBS DB scheme. Message generation is broken into two separate and distinct areas, automatic and interactive, with areas sharing common functionality. Regardless of the method used for message generation, the message processing module shall provide a means to submit messages, to the communications system, by precedence where the highest precedence is processed first. Rank order of precedence is:

a. Emergency Command Precedence (ECP)

b. Flash
c. Immediate
d. Priority
e. Routine

MP 3.2.2.1.1 Message Auto Generation

Automatic message generation may be activated by multiple means, some internal to the message processing module while others are external. An examples of an internal process that may activate automatic message generation would be satisfaction of a SRI where the user has directed that satisfaction of a SRI criteria requires auto generation and output of a message to an external source. An example of an external activator, for automatic message generation, could be satisfaction of a Data Base (DB) SRI where the user has directed the system to create a message based upon specified activity occurring in the DB. In either case, the automatic message generation module requires that certain data be provided, such as format, addressee, message type, and adequate data to populate mandatory fields. The message processor shall be able to automatically generate messages for release based on:

3.2.2.1.1.1 Data routed to auto generation as the result of satisfaction of a SRI

Traceability:
Priority ???

3.2.2.1.1.2 Data routed to auto generation as the result of a query, either at the direction of a process or a user

Traceability:
Priority ???

3.2.2.1.1.3 Data routed to auto generation as the result of user request based on selection of an icon, symbology, and/or feature object from a map display

Traceability:
Priority ???

MP 3.2.2.1.2 Interactive Generation

Interactive message generation relies upon input from a user to complete the message build. The process will be supported by some automated actions for fill of common fields with default information but will rely upon the user to supply data fill to areas which contain user/system “information”. The message processor shall:

3.2.2.1.2.1 Provide an annotated form (template) for interactively constructing each of the message sets specified in MIL STD 6040 and supported service unique standards, as specified in paragraph 3.2.

Traceability:
Priority ???

3.2.2.1.2.2 Provide on-line and interactive help (context sensitive) in preparation of messages as provided by the electronic data representation of the associated message standard, when it exists as part of the message definition contained in the USMTF CDBS or appropriate format.

Traceability:
Priority ???

3.2.2.1.2.3 Support interactive message generation where input of any message field is supported in any combination of the following:

Traceability:
Priority ???

a. User via keyboard entry and/or edit

Traceability:
Priority ???

b. User via cut and paste

Traceability:
Priority ???

c. Query results

Traceability:
Priority ???

d. Validated data entry tables

Traceability:
Priority ???

3.2.2.1.2.4 Provide default values for message fields or sets which are user-definable or delectable.

Traceability:
Priority ???

3.2.2.1.2.5 Provide a capability for forwarding messages for coordination.

Traceability:
Priority ???

3.2.2.1.2.6 Provide the user the capability to edit and reroute or submit a message for release.

Traceability:
Priority ???

3.2.2.1.2.7 Provide the user with message addressing parameters to allow message routing to a specific address

Traceability:
Priority ???

3.2.2.1.2.8 Provide the user with message addressing parameters to allow message routing to multiple addresses

Traceability:
Priority ???

3.2.2.1.2.9 Support interactive message generation where auto filled sets/fields are modifiable by the user.

Traceability:
Priority ???

3.2.2.1.2.10 Support interactive message generation where input is through cut and paste operations and copied and pasted from previous set/field entries in same message.

Traceability:
Priority ???

3.2.2.1.2.11 Support interactive message generation where input is through cut and paste operations and copied and pasted from previous set/field entries in another message.

Traceability:
Priority ???

3.2.2.1.2.12 Support interactive message generation where input is through cut and paste operations and copied and pasted from text in another window

Traceability:
Priority ???

3.2.2.1.2.13 Support interactive message generation allowing the user to retrieve message from a storage area and edit of that message.

Traceability:
Priority ???

MP 3.2.2.1.3 Format Selection

Messages contain communication system specific header data elements used for selection of a protocol necessary for communications between systems. The communications module relies on the message processing module to pass parameters, such as originator, addressee, DTG, classification, etc. to it in order to determine what message format was used in creation of the message and what protocol is required. The JANAP-128 and ACP-126 (modified) message formats are two of the most commonly used header definitions.

The message processor shall be capable of selectively supporting message generation using the formats defined in paragraph 3.3.2.7.

Traceability:
Priority ???

MP 3.2.2.2 Message Coordination and Release

There is more than one way to create a message. A message may get generated based upon a SRI satisfaction where the information which caused satisfaction of the SRI criteria is forwarded for automatic message generation and to the communications module for release or the combined effort of multiple user where the finished product should be reviewed and concurred to by all prior to release. Also, maybe only one individual has been granted the authority to release messages. To facilitate coordination and release requirements the message processing module shall:

3.2.2.2.1 Support serial coordination of messages.

Traceability:
Priority ???

3.2.2.2.2 Support parallel coordination of messages.

Traceability:
Priority ???

3.2.2.2.3 Allow the user to specify distribution of internally coordinated messages either adhoc or via user-defined distribution lists.

Traceability:
Priority ???

3.2.2.2.4 Provide the capability to create a list of message coordination and release personnel.

Traceability:
Priority ???

3.2.2.2.5 Provide the capability to maintain a list of message coordination and release personnel.

Traceability:
Priority ???

3.2.2.2.6 Provide the capability to delete a list of message coordination and release personnel.

Traceability:
Priority ???

3.2.2.2.7 Provide the capability to notify the members on a list of message coordination and release personnel when they have a message awaiting review.

Traceability:
Priority ???

3.2.2.2.8 Allow users to annotate coordination messages with their comments and route those comments back to the drafter of the message.

Traceability:
Priority ???

3.2.2.2.9 Provide the capability for members on the message coordination and release list to edit a message under review.
Traceability:
Priority ???

3.2.2.2.10 Distribute internally generated messages according to a routing list specified by the user.
Traceability:
Priority ???

3.2.2.2.11 Notify users when they have a message awaiting coordination.
Traceability:
Priority ???

3.2.2.2.12 Allow users to view the status of a message during the coordination cycle.
Traceability:
Priority ???

3.2.2.2.13 Allow users to receive notification when a suspense has been missed.
Traceability:
Priority ???

3.2.2.2.14 Authenticate releaser or release processes against a list of authorized message releasers.
Traceability:
Priority ???

3.2.2.2.15 Allow the releaser to reject the message back to the drafter.
Traceability:
Priority ???

MP 3.2.3 Message Processing Support Services

The message processing module is made up of many stand alone and callable smaller modular. These modules can be, and are, used for both inbound and outbound processing. This architecture supports the concept of “sizing” by allowing the using system to select only modules which are necessary to perform functions desired by their user. The following paragraphs, along with Figure 3, describe support services.

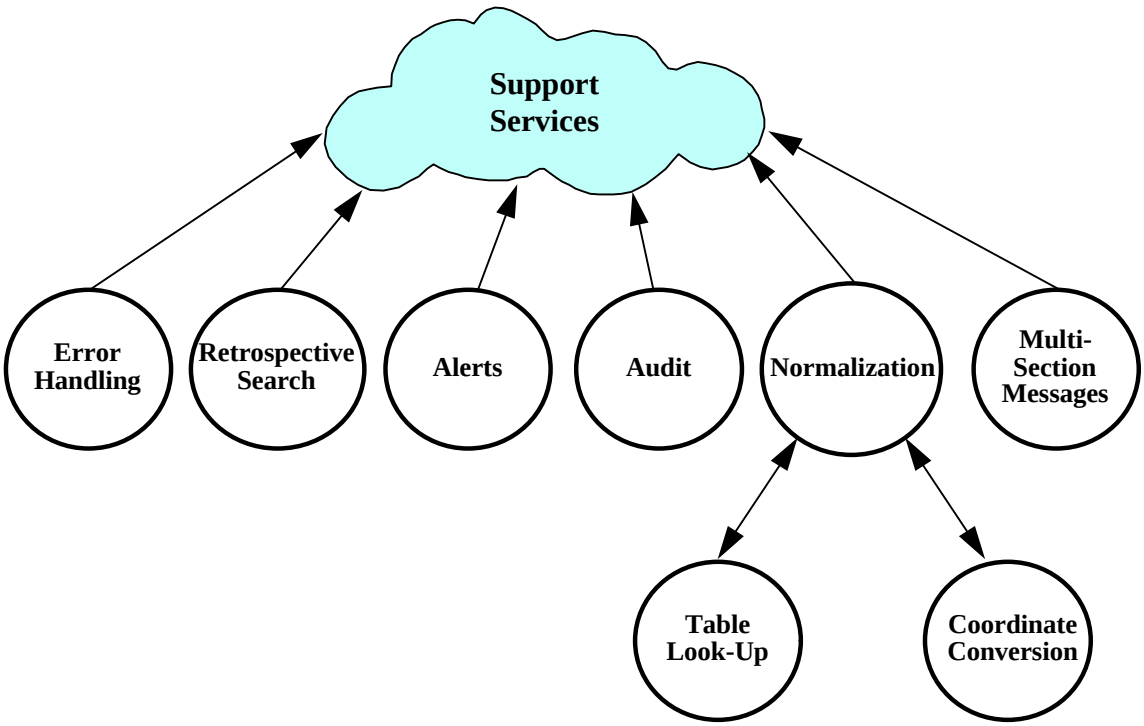

Figure 3. Message Processing Support Services

MP 3.2.3.1 System Configuration

System configuration, for the message processing module, concerns selection a routing table to be used for this session or message definition file (the system may have multiple message standard baselines loaded on the system but only one in use at any given time). At system start up the message processor will default to the configuration present when last terminated. The system administrator may change configuration items active at any time without adversely impacting other system resources and have the change implemented upon the next system call to the configuration item changed.

MP 3.2.3.1.1 Start-up

3.2.3.1.1.1 At start up, the message processor shall default to the configuration present at last termination
Traceability:
Priority ???

3.2.3.1.1.2 The system administrator shall be allowed to change configuration upon validation of the administrator's access rights
Traceability:
Priority ???

MP 3.2.3.1.2 Termination

The message processor shall save its current configuration at termination in order to be restarted.
Traceability:
Priority ???

MP 3.2.3.2 Error Handling

The message processor must be capable of accepting error conditions from internal and external sources. While error conditions will occur internally, failure of a message to pass validation checking, the message processor must also be capable of handling external errors, such as rejection of data passed by it to another module. One such source could be the communications module if the communications module failed to recognize a Plain Language Address (PLA) on a message passed to it. To enable error handling the message processor shall:

3.2.3.2.1 Provide for presentation of the error to a user for action

Traceability:
Priority ???

3.2.3.2.2 Provide the capability for an authorized operator to review (and override) the rejection of messages due to validation and/or verification errors.

Traceability:
Priority ???

3.2.3.2.3 Provide the capability to suspend the processing of messages received with validation and verification errors pending user review and correction.

Traceability:
Priority ???

3.2.3.2.4 Provide the capability for parser to resume processing of messages with errors after user review and correction.

Traceability:
Priority ???

3.2.3.2.5 Accept an error condition from the communications module when

a. the message contains errors

Traceability:
Priority ???

b. the message transmission is abnormally terminated

Traceability:
Priority ???

MP 3.2.3.3 Audit

The message processing module shall support audit requirements as specified in paragraph 3.8 and the Security Administration SRS.

MP 3.2.3.4 Retrospective Search

Users of the message processing module must have the capability to retrieve data from the operational journal. Retrieval is required to support message generation, such as changing a minimum amount of information in an existing message and transmit it as a new one, or the user needs to do some research prior to generating a message. In addition, the message processor shall:

3.2.3.4.1 Provide users the capability to search the message journal retrospectively for the messages of interest based on defined search criteria against the complete message and any annotations. The search criteria shall be definable using a SQL based language.

Traceability:
Priority ???

3.2.3.4.2 Provide processes the capability to search the message journal retrospectively for the messages of interest based on defined search criteria against the complete message and any annotations. The search criteria shall be definable using a SQL based language.
Traceability:
Priority ???

3.2.3.4.3 Provide the user the ability to enter search interactively via a user interface.
Traceability:
Priority ???

3.2.3.4.4 Provide the user the ability to enter delivery information interactively via a user interface.
Traceability:
Priority ???

3.2.3.4.5 Have no set limit on the maximum number of searches that can be run against a particular message.
Traceability:
Priority ???

3.2.3.4.6 Have no set limit on the maximum number of users or processes to which results of a search can be sent.
Traceability:
Priority ???

3.2.3.4.7 Support modification of an old message therefore creating a new message by

a. Retrieve and display a whole message
Traceability:
Priority ???

b. Editing of the displayed message, to include format lines
Traceability:
Priority ???

c. Replacement of existing addressees
Traceability:
Priority ???

d. Allow the revised message to be submitted as a new message
Traceability:
Priority ???

MP 3.2.3.5 Normalization

Normalization is the process by which data is transformed from one representation to a second form. In the case of normalization for an incoming message, data normalization is required to change the data representation of data in the message to one usable by the host system. Using this definition one can see a requirement to normalize data during message generation also. To support data normalization, the message processor shall:

3.2.3.5.1 Provide the capability to normalize the data in received messages to a form desired for use within the using system.
Traceability:
Priority ???

3.2.3.5.2 Normalize data from an inbound messages to a form required by the application system in real or near-real time via a normalization algorithm and/or alias tables.
Traceability:
Priority ???

3.2.3.5.3 Support coordinate conversion as provided by a coordinate conversion algorithm.
Traceability:
Priority ???

MP 3.2.3.6 BOM to COM Conversion

The message processing module is required to process Bit-Oriented-Messages (BOM) in addition to Character Oriented Messages (COM). To support this requirement the message processor shall:

3.2.3.6.1 Provide the ability to translate BOM messages to COM for continued processing, or
Traceability:
Priority ???

3.2.3.6.2 Provide the ability to parse BOM messages, or
Traceability:
Priority ???

3.2.3.6.3 Provide a path by which BOM messages may be passed directly to system resources for additional processing
Traceability:
Priority ???

MP 3.2.3.7 Message Data Tables

Message data tables shall be constructed automatically from the MTF CDBS. The message processor does not care what message standards are supported in the message data table as long as those proposed conform to the MTF CDBS scheme. Given that all information required by the CDBS is available, the message processor will contain all the information required to parse, generate, validate, and provide on-line help for messages processed by the module. The message processor shall:

3.2.3.7.1 Allow the message data tables to be dynamically modified by an authorized user to:
Traceability:
Priority ???

a. create new alias table entries
Traceability:
Priority ???

b. modify data field contents (extend valid entry/code list)
Traceability:
Priority ???

c. dynamic definition of database element definitions (e.g.; data normalization)
Traceability:
Priority ???

3.2.3.7.2 Provide the capability to update 100 percent of the supported messages from the CDBS.
Traceability:
Priority ???

MP 3.2.3.8 Message Validation

Validation occurs for both inbound and outbound message processing, the difference being that on inbound processing validation is optional and on outbound processing it is mandatory. Validation on inbound messages relies upon the user to determine the amount of validation, if any, to occur. If the user

elects to validate the messages and errors are detected further processing is inhibited until the error is resolved. For inbound validation the message processor shall:

3.2.3.8.1 Provide the capability to validate operational or exercise markings against the operational state.
Traceability:
Priority ???

3.2.3.8.2 Perform validation for those message formats outlined in 3.3.2.7
Traceability:
Priority ???

3.2.3.8.3 Validate for correct format, content and conditionally in accordance with approved format tables and data entry code lists for message format types outlined in 3.3.2.7
Traceability:
Priority ???

3.2.3.8.4 Route messages with detected validation errors to a user for interactive correction.
Traceability:
Priority ???

3.2.3.8.5 Provide the user with aides to correct message validation errors the system identifies.
Traceability:
Priority ???

3.2.3.8.6 Validate that all message mandatory sets/fields exist
Traceability:
Priority ???

3.2.3.8.7 Validate that mandatory set/field contain allowable values
Traceability:
Priority ???

3.2.3.8.8 Validate use of optional and conditional/fields sets
Traceability:
Priority ???

3.2.3.8.9 Validate that optional and conditional set/field contain allowable values
Traceability:
Priority ???

3.2.3.8.10 Determine that the set contains all mandatory fields.
Traceability:
Priority ???

3.2.3.8.11 Determine that the set contains no more than the specified maximum number of fields
Traceability:
Priority ???

3.2.3.8.12 Determine that the set sequence ordering conforms to the standard specification.
Traceability:
Priority ???

3.2.3.8.13 Determine that the segment ordering conforms to the standard specification.
Traceability:
Priority ???

3.2.3.8.14 Determine whether all special instructions specified in the standard are followed in the message.
Traceability:
Priority ???

3.2.3.8.16 Provide for a manual over-ride of identified validation errors for outbound messages
Traceability:
Priority ???

MP 3.2.3.9 Multi-Sectioned Messages

The message processor must be capable of supporting the communications module requirement that packets released to it for transmission conform to size limitations. Conformance is normally termed message segmentation. To support message segmentation the message processor shall provide the capability to section a message into segments, having a maximum length of 40,000 bytes per segment. Additionally, the message processor shall:

3.2.3.9.1 Create a single message from all sections of a multi-part message received in an operator setable time period.
Traceability:
Priority ???

3.2.3.9.2 Process an incomplete sectioned message at user direction.
Traceability:
Priority ???

3.2.3.9.3 Ensure that the message is displayed in section order regardless of whether sections are received out-of-sequence or are missing.
Traceability:
Priority ???

3.2.3.9.4 Place an indicator in the reconstituted message where portions of the message/message text are missing.
Traceability:
Priority ???

MP 3.2.3.10 Message Annotation

Message coordination, parsing, and retrospective search are possible processes requiring the user to attach comments to a message stored in the operational message journal. For sure, reviewers of a message will want to comment on the message preparation/content and/or attach a sign-off on messages prior to release. To support message annotation, the message processor shall:

3.2.3.10.1 Provide a mechanism whereby memorandums may be attached to a base record
Traceability:
Priority ???

3.2.3.10.2 Insure that attached comments are not released along with the base record
Traceability:
Priority ???

3.2.3.10.3 Place no limitation on the number of memorandums which may be attached to any one base record
Traceability:
Priority ???

MP 3.2.3.11 Message Retransmission

The message processing module must appropriately mark messages retrieved during retroactive search and reintroduced into a network/net for forwarding to another destination. An example of this could be generation and release of a unit status message where there is minor changes from day to day. The user requires the ability to retrieve a previous message, modify it, and reintroduce the message into

the system as a new message. Also, a higher unit may want to retransmit a message to a lower echelon, for information purpose, and only add that user as an address, virtually unchanging the original message. The message processing module shall:

3.2.3.11.1 Release messages with changes in the “TO” and/or “INFO” lines and no changes to text in a re-addressal format.

Traceability:
Priority ???

3.2.3.11.2 Release messages no changes to text as corrected copy (i.e. ZDK as ZZS is utilized when an error is made by the serving communications center).

Traceability:
Priority ???

3.2.3.11.3 Mark messages which have been retrieved from a storage area that have been acknowledged as delivered but are reintroduced with no changes as exact duplicates (ZFG).

Traceability:
Priority ???

3.2.3.11.4 Mark messages which have been retrieved from a storage area that have not been positively acknowledged for relay/delivery and are forward with no other changes as suspected duplicates (ZFD).

Traceability:
Priority ???

MP 3.2.3.12 Operational Journal

The message processor shall provide an area where both inbound and outbound messages are filed. Records placed in the operational journal will be accessible by authorized users for retrieval, annotation, and/or additional processing. The operational journal shall:

3.2.3.12.1 Provide the capability to generate/display directory of journal records

Traceability:
Priority ???

3.2.3.12.2 Provide the capability to log the following information from received and transmitted messages:

Traceability:
Priority ???

a. Date and time of message origination - Date Time Group (DTG)

Traceability:
Priority ???

b. Date and time the message was received

Traceability:
Priority ???

c. Subject/Message ID

Traceability:
Priority ???

d. Message originator

Traceability:
Priority ???

e. Message destination

Traceability:
Priority ???

f. Security classification (including codewords/nicknames and handling caveats)
Traceability:
Priority ???

g. Message identification and number.
Traceability:
Priority ???

3.2.3.12.3 Provide the capability to selectively log the following information from received and transmitted messages at the request of an application program:
Traceability:
Priority ???

a. Message sender
Traceability:
Priority ???

b. Message type
Traceability:
Priority ???

c. Message transmission status
Traceability:
Priority ???

3.2.3.12.4 Provide the capability to selectively retrieve the logged message information.
Traceability:
Priority ???

3.2.3.12.5 Provide the capability to maintain the status of all messages under coordination and release review.
Traceability:
Priority ???

3.2.3.12.6 Provide the capability for members on the message coordination and release list to access the status of all messages under coordination.
Traceability:
Priority ???

3.2.3.12.7 Provide the capability to store the contents of the receive queue for subsequent retrieval in the event of a W/S re-initialization.
Traceability:
Priority ???

3.2.3.12.8 Provide the capability to store selected messages on-line for quick access. Storage parameters shall include the message profile (i.e., type, originator, precedence) and specified time period (i.e., for 1, 2, 6, 12, 24, and 48 hours).
Traceability:
Priority ???

3.2.3.12.9 Provide the capability to search the message storage for messages of interest based upon a user-defined set of search criteria.
Traceability:
Priority ???

3.2.3.12.10 Provide the capability to define message storage space capacity and threshold depletion limits.
Traceability:
Priority ???

3.2.3.12.11 Provide the capability to monitor message storage space for depletion.
Traceability:
Priority ???

3.2.3.12.12 Provide the capability to route messages to an alternate, selectable, device when the message storage area limits are reached.
Traceability:
Priority ???

3.2.3.12.13 Provide the capability to disable the acceptance of incoming non-ECP and non-Flash messages when primary storage devices are full
Traceability:
Priority ???

3.2.3.12.14 Provide the capability to delete the oldest messages having the same or lower precedence as the incoming message in order to make room when the message storage area is full and acceptance of incoming messages is not disabled.
Traceability:
Priority ???

3.2.3.12.15 Provide the capability to enable the acceptance (for storage) of incoming messages according to message precedence.
Traceability:
Priority ???

3.2.3.12.16 Provide the capability for an application program to delete selected messages from the message storage area.
Traceability:
Priority ???

MP 3.2.3.13 Performance Requirements

3.2.3.13.1 For UNIX based systems, the message processing module shall meet the performance goals specified below:
Traceability:
Priority ???

3.2.3.13.1a The message processing module should meet user responsiveness times as specified in Table 1.
Traceability:
Priority ???

Function	Criteria
From the time that the user orders its formulation, display or make available for display by scrolling or paging the first page of a summary display.	50% in 1.5 sec 95% in 2.0 sec 100% in 2.5 sec
In response to a command for a general database search, assemble, order, and format a summary display from the message database and transfer and display the first page.	50% in 3.0 sec 95% in 4.0 sec 100% in 5.0 sec
Reorder a summary display, such as rearranging the sequence, adding or deleting message summary fields, or producing a display containing a subset of the original display.	50% in 1.0 sec 95% in 2.0 sec 100% in 2.5 sec
Retrieve and display the first page of a message stored in the system database in response to user interaction with the associated message summary display.	50% in 1.5 sec 95% in 2.0 sec 100% in 2.5 sec
Display the first page of a message stored off-line after acknowledgment that off-line media must be transferred to an on-line device.	10 min

Make available for display, by scrolling or paging, the next or preceding page of an object, after the current page has been viewed for one second.	1.0 sec
Scroll rate.	20 lines/sec
Error feedback following completion of an input.	3.0 sec
Response to simple command (e.g., delete message).	1.0 sec
Response to complex command (e.g., advise a user that a requested message has been archived).	4.0 sec

Table 1. User Responsiveness Performance Criteria

3.2.3.13.1b The message processing module should meet message in-processing times as specified in Table 2.

Traceability:
Priority ???

Precedence	Time (Sec)
95% of ECP messages	10
100% of ECP messages	30
95% of Flash messages	15
100% of Flash messages	60
95% of Immediate messages	30
100% of Immediate messages	120
95% of Priority messages	60
100% of Priority messages	240
95% of Routine messages	120
100% of Routine messages	500

Table 2. In-Processing Performance Requirements

3.2.3.13.1c The message processing module should meet message out-processing times as specified in Table 3.

Traceability:
Priority ???

Precedence	Time (Sec)
95% of CRITIC messages	10
100% of CRITIC messages	30
95% of ECP messages	10
100% of ECP messages	30
95% of Flash messages	20
100% of Flash messages	60
95% of Immediate messages	60
100% of Immediate messages	240
95% of Priority messages	120
100% of Priority messages	500
95% of Routine messages	360
100% of Routine messages	1000

Table 3. Out-Processing Performance Requirements

3.2.3.13.2 For Windows/DOS based systems, the message processing module shall meet the performance goals of TBD.

Traceability:
Priority ???

MP 3.2.4 Requirements Submitted by the Army

3.2.4.1 The Operational Message Journal (OMJ) shall provide the capability to receive from the CMP the following formatted and validated message types:

1. DOI-103

   Traceability: ARMY, 20 July 1996
   Priority ???

2. DOI-103M

   Traceability: ARMY, 20 July 1996
   Priority ???

3. JANAP-128

   Traceability: ARMY, 20 July 1996
   Priority ???

4. DD-173

   Traceability: ARMY, 20 July 1996
   Priority ???

3.2.4.2 The Operational Message Journal (OMJ) shall provide the capability to store the following formatted and validated message types:

1. DOI-103

   Traceability: ARMY, 20 July 1996
   Priority ???

2. DOI-103M

   Traceability: ARMY, 20 July 1996
   Priority ???

3. JANAP-128

   Traceability: ARMY, 20 July 1996
   Priority ???

4. DD-173

   Traceability: ARMY, 20 July 1996
   Priority ???

3.2.4.3 An Operational Message Journal Access (OMJA) capability shall be provided to allow an analyst to selectively read messages stored in the Operational Message Journal.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.4.4 The Operational Message Journal (OMJ) shall provide the capability to update the Operational Message Journal's supplemental data upon receipt of a command from the CMP.

Traceability: ARMY, 20 July 1996
Priority ???

OA 3.2 Office Automation Functional Requirements

The office automation functional area currently contains five sub components: Word Processing, Electronic Mail, Presentation Graphics, Spreadsheet, and Drawing/Illustration. It is possible that a single package may support more than one sub component. The following sections set forth requirements for each of the five sub-components, however, global requirements, which all office automation products must adhere to, have been gathered into a global functional requirements section with specific functional requirements for each office automation package to follow.

OA 3.2.1 Global Functional Requirements

The following section contains global functional requirements for all office automation products in the DII COE.

3.2.1.1 The office automation software shall be capable of operating in a WYSIWYG mode.
Traceability:
Priority 1

3.2.1.2 The office automation software shall meet the guidelines set forth in the DII Style Guide. The DII COE Style Guide provides a common framework for human computer interface design and implementation, defining the long-term functional goals, objectives and requirements of the human computer interface.
Traceability:
Priority 1

3.2.1.3 The office automation software shall comply with the Inter-Client Communications Conventions Manual (ICCCM).
Traceability:
Priority 1

3.2.1.4 The office automation software shall comply with POSIX 1003.1.
Traceability:
Priority 1

3.2.1.5 The office automation software shall provide context-sensitive on-line help.
Traceability:
Priority 1

3.2.1.6 The office automation software shall allow the arbitrary placement of software on clients and/or servers without impact to the user.
Traceability:
Priority 1

3.2.1.7 The office automation software shall allow the administrator to specify path and directory information for software installation.
Traceability:
Priority 1

3.2.1.8 The office automation software shall not remap function keys, color maps, or any other shared resources in a way that prevents other applications from running correctly.
Traceability:
Priority 1

3.2.1.9 The office automation software shall support PostScript Level 2 page description language for printing and shall allow the user to generate PostScript Level 2 files.
Traceability:
Priority 1

3.2.1.10 The office automation software shall provide spell checking with the capability to add user-defined words.
Traceability:
Priority 1

OA 3.2.2 Word Processing

The following section contains functional requirements for word processing office automation products in the DII COE.

3.2.2.1 The Word Processing software shall support the import and export of documents in the following formats for exchange of legacy data. It is the intent to move to one standard format for document exchange, however, for migration purposes, multiple file formats must be supported.

a. ASCII Text

Traceability:
Priority 1

b. Word Perfect V6.0

Traceability:
Priority 1

c. Microsoft Word V2.0 and V6.0

Traceability:
Priority 1

d. Interchange Format (RTF)

Traceability:
Priority 1

e. Lotus WKS/WK1/WK3

Traceability:
Priority 1

f. Standard General Markup Language (SGML)

Traceability:
Priority 1

g. Hyper Text Markup Language (HTML)

Traceability:
Priority 1

h. Encapsulated PostScript (EPS)

Traceability:
Priority 1

3.2.2.2 The Word Processing software shall support the import of graphics in the following formats:

a. Computer Graphics Metafile (CGM)

Traceability:
Priority 1

b. Tagged Image File Format (TIFF) R and G

Traceability:
Priority 1

c. Encapsulated PostScript (EPS)

Traceability:
Priority 1

d. Graphics Interchange Format (GIF)

Traceability:
Priority 1

e. Portable Bitmap (PBM)

Traceability:
Priority 1

f. PC Paintbrush (PCX)

Traceability:
Priority 1

3.2.2.3 The Word Processing software shall provide for the import of text and graphic files to be incorporated in a document by reference or copied into the document.
Traceability:
Priority 1

3.2.2.4 The Word Processor software shall support the message generation requirements of DII Message Processing System text processing subsystem for generation of free text messages.
Traceability:
Priority 1

3.2.2.5 The Word Processing software shall support at least 158 columns per line, 250 lines per page, and 500 pages per document.
Traceability:
Priority 1

3.2.2.6 The Word Processing software shall allow the user to specify page length and page width and set page orientation (landscape or portrait).
Traceability:
Priority 1

3.2.2.7 The Word Processing software shall allow automatic numbering of chapters, sections, subsections, and paragraphs using a user-selected numbering system.
Traceability:
Priority 1

3.2.2.8 The Word Processing software shall allow automatic page numbering with options for all pages, a defined range of pages, and numbering to begin on any page.
Traceability:
Priority 1

3.2.2.9 The Word Processing software shall allow user-specified page numbering and several page numbering styles (e.g., roman, standard, appendix).
Traceability:
Priority 1

3.2.2.10 The Word Processing software shall provide for the automatic creation of a table of contents and index.
Traceability:
Priority 1

3.2.2.11 The Word Processing software shall allow the user to set columns (newspaper and parallel formats), set tabs, change fonts (typefaces), indent text, specify line spacing (single, double, etc.), set margins (left, right, top, and bottom), and insert page breaks.
Traceability:
Priority 1

3.2.2.12 The Word Processing software shall allow the user to create figure boxes, text boxes, table boxes, graphics boxes and horizontal and vertical line drawing.
Traceability:
Priority 1

3.2.2.13 The Word Processing software shall allow the user to use and change text justification (left, right, center, and full).
Traceability:
Priority 1

3.2.2.14 The Word Processing software shall provide on-screen text formatting with automatic text realignment.

Traceability:
Priority 1

3.2.2.15 The Word Processing software shall allow the user to indent blocks of text from both the left and right margins without changing the document margins.

Traceability:
Priority 1

3.2.2.16 The Word Processing software shall provide automatic carriage return and cursor wraparound for both column and full width modes.

Traceability:
Priority 1

3.2.2.17 The Word Processing software shall allow the user to override page break placement.

Traceability:
Priority 1

3.2.2.18 The Word Processing software shall allow the user to mark a block of text to move, copy, repeat copy without remarking, or delete.

Traceability:
Priority 1

3.2.2.19 The Word Processing software shall allow the user to mark a block of text (in order to narrow the scope of text formatting, spell checking, and calculation functions) to affect only the area marked by block of text.

Traceability:
Priority 1

3.2.2.20 The Word Processing software shall allow the user to delete text by character, word, line, remainder of line, or user-defined block.

Traceability:
Priority 1

3.2.2.21 The Word Processing software shall allow the user to insert an imported document or data file at the location of the cursor.

Traceability:
Priority 1

3.2.2.22 The Word Processing software shall provide boldface and italics.

Traceability:
Priority 1

3.2.2.23 The Word Processing software shall provide subscripts and superscripts.

Traceability:
Priority 1

3.2.2.24 The Word Processing software shall allow the user to convert the case of selected text.

Traceability:
Priority 1

3.2.2.25 The Word Processing software shall allow the user to underline words only, and words and spaces as an unbroken line.

Traceability:
Priority 1

3.2.2.26 The Word Processing software shall allow the user to define, save, and reuse, in subsequent editing sessions, multiple page formats within a document (e.g., margins; tabs; ruler; page, paragraph, columns, headers, footers, page and line numbering; footnotes, end notes).
Traceability:
Priority 1

3.2.2.27 The Word Processing software shall allow multiple users to open multiple copies of the same or different documents concurrently.
Traceability:
Priority 1

3.2.2.28 The Word Processing software shall provide a ruler.
Traceability:
Priority 1

3.2.2.29 The Word Processing software shall provide a status line and menus.
Traceability:
Priority 1

3.2.2.30 The Word Processing software shall provide macro record and playback facilities to support repeated entry of keystroke combinations, including function keys.
Traceability:
Priority 1

3.2.2.31 The Word Processing software shall provide automatic timed backups to storage media at a user-defined interval.
Traceability:
Priority 1

3.2.2.32 The Word Processing software shall allow the user to undo at least the last change.
Traceability:
Priority 1

3.2.2.33 The Word Processing software shall allow the user to abort an editing session and revert to the original document while disregarding all changes made during the session.
Traceability:
Priority 1

3.2.2.34 The Word Processing software shall allow movement between two documents (including the same document in two separate windows) using up to a full screen display for each document for two or more concurrently active (open) documents.
Traceability:
Priority 1

3.2.2.35 The Word Processing software shall allow the user to perform all the capabilities outlined in this document for one active document should two or more documents be concurrently open.
Traceability:
Priority 1

3.2.2.36 The Word Processing software shall allow the user to move the cursor left, right, up, and down swing keyboard arrow keys and shall allow the user to move the cursor directly to the first or last character in a line.
Traceability:
Priority 1

3.2.2.37 The Word Processing software shall allow cursor movement to the next screen of text which shall include the last one to four lines of text from the previous screen.
Traceability:
Priority 1

3.2.2.38 The Word Processing software shall allow cursor movement to the previous screen of text which shall include the first one to four lines of text from the following screen.
Traceability:
Priority 1

3.2.2.39 The Word Processing software shall allow the user to move the cursor directly to the previous or next page of text.
Traceability:
Priority 1

3.2.2.40 The Word Processing software shall allow the user to move the cursor directly to a user-selected page number.
Traceability:
Priority 1

3.2.2.41 The Word Processing software shall allow the user to move the cursor directly to the first character of the document (top) or to the end of the document.
Traceability:
Priority 1

3.2.2.42 The Word Processing software shall allow the user to move the cursor directly to the beginning or end of the screen.
Traceability:
Priority 1

3.2.2.43 The Word Processing software shall allow the user to scroll the text vertically one line at a time, up and down.
Traceability:
Priority 1

3.2.2.44 The Word Processing software shall allow the user to scroll the text horizontally, left and right, to a width of at least 158 characters.
Traceability:
Priority 1

3.2.2.45 The Word Processing software shall allow the user to perform search and search-and-replace functions within user-defined ranges, or globally throughout the document.
Traceability:
Priority 1

3.2.2.46 The Word Processing software shall permit search functions on occurrences of user-specified character strings (ASCII characters including carriage returns, control codes(e.g., bold, margin, tabs, etc.), and/or keyboard-generated characters).
Traceability:
Priority 1

3.2.2.47 The Word Processing software shall provide the capability for the automatic numbering and placement of footnotes and endnotes throughout the document with endnote consolidation at the end of document.
Traceability:
Priority 1

3.2.2.48 The Word Processing software shall allow the user to associate footnotes and endnotes with the appropriate text so reformatting, adding, or deleting text does not cause the note to be relocated.
Traceability:
Priority 1

3.2.2.49 The Word Processing software shall allow the user to:
a. place header and footer text at the top and bottom of each page of a document.

Traceability:
Priority 1

b. place a minimum off our lines of header/footer text at the top and bottom of each page of a document.

Traceability:
Priority 1

c. place header and footer text from a designated page of a document to the end of the document.

Traceability:
Priority 1

d. maintain headers and footers on all pages or alternating pages of a document until another header or footer is entered by the user.

Traceability:
Priority 1

e. alternate between header and footer formats for odd and even pages.

Traceability:
Priority 1

f. prevent changes to the body of a document from affecting the headers and footers and, conversely, prevent changes to headers and footers from affecting the body of a document.

Traceability:
Priority 1

g. automatically generate page numbers inside headers and footers.

Traceability:
Priority 1

3.2.2.50 The Word Processing software shall provide the capability for automatic alignment of vertical columns.

Traceability:
Priority 1

3.2.2.51 The Word Processing software shall allow the user to format text within columns without affecting column parameters.

Traceability:
Priority 1

3.2.2.52 The Word Processing software shall provide the capability for alignment of columns of decimal figures on the decimal point.

Traceability:
Priority 1

3.2.2.53 The Word Processing software shall allow the user to change the number of copies to be printed.

Traceability:
Priority 1

3.2.2.54 The Word Processing software shall allow the user to print all pages, selected pages, or marked pages of a document.

Traceability:
Priority 1

3.2.2.55 The Word Processing software shall permit the user to select manual or continuous paper feeding.
Traceability:
Priority 1

3.2.2.56 The Word Processing software shall allow the user to change between draft and letter quality print selection.
Traceability:
Priority 1

3.2.2.57 The Word Processing software shall allow the user to select between logical print devices.
Traceability:
Priority 1

3.2.2.58 The Word Processing software shall allow the user to select print job management (e.g., cancel, rush, display progress).
Traceability:
Priority 1

3.2.2.59 The Word Processing software shall provide support for both fixed and scaleable type fonts to include scaling of point size and characters per inch.
Traceability:
Priority 1

3.2.2.60 The Word Processing software shall provide a document print preview.
Traceability:
Priority 1

3.2.2.61 The Word Processing software shall provide an on-line thesaurus.
Traceability:
Priority 1

3.2.2.62 The Word Processing software shall provide document style guides or templates.
Traceability:
Priority 1

3.2.2.63 The Word Processing software shall provide an outliner.
Traceability:
Priority 1

3.2.2.64 The Word Processing software shall provide a label generation capability.
Traceability:
Priority 1

3.2.2.65 The Word Processing software shall allow the user to create, move, rename, and delete user-specified documents and document directories from a menu (i.e., file management).
Traceability:
Priority 1

3.2.2.66 The Word Processing software shall provide a document markup capability including redline and strikeout.
Traceability:
Priority 1

3.2.2.67 The Word Processing software shall provide hot keys for the more repetitive functions.
Traceability:
Priority 1

3.2.2.68 The Word Processing software shall provide widow and orphan line protection.
Traceability:
Priority 1

3.2.2.69 The Word Processing software shall provide automatic hyphenation at the end of a line.
Traceability:
Priority 1

3.2.2.70 The Word Processing software shall allow the user to incorporate mathematical/scientific symbols and foreign character sets (e.g., Greek, Hebrew, Cyrillic, German, French, Russian).
Traceability:
Priority 1

3.2.2.71 The Word Processing software shall allow sorting selected text within a table by paragraph and line.
Traceability:
Priority 1

3.2.2.72 The Word Processing software shall allow the user to reposition and scale graphics once they are in the document.
Traceability:
Priority 1

OA 3.2.3 Electronic Mail

The following section contains functional requirements for electronic mail office automation products in the DII COE.

3.2.3.1 The Electronic Mail software shall comply with the following standards:

a. Simple Mail Transport Protocol (SMTP)
Traceability:
Priority 1

b. International Consultative Committee on Telegraphy and Telephone (CCITT) X.400 (or written migration plan to CCITT X.400)
Traceability:
Priority 1

c. Multipurpose Internet Mail Extensions (MIME)-RFC 1341
Traceability:
Priority 1

3.2.3.2 The Electronic Mail software shall be compatible with and interoperate with the DII Message Processing System for message distribution and introduction of messages to be released.
Traceability:
Priority 1

3.2.3.3 The Electronic Mail software shall provide the capability to create, send, answer and route messages.
Traceability:
Priority 1

3.2.3.4 The Electronic Mail software shall provide the capability to save a message in a defined storage location for later retrieval.
Traceability:
Priority 1

3.2.3.5 The Electronic Mail software shall provide the capability to save an in-progress message for later editing and sending.

Traceability:
Priority 1

3.2.3.6 The Electronic Mail software shall have folder-oriented file system access available within the application software.

Traceability:
Priority 1

3.2.3.7 The Electronic Mail software shall provide the following fields in each mail message: addressees, copy recipients, subject, message body, originator, time sent, date sent.

Traceability:
Priority 1

3.2.3.8 The Electronic Mail software shall be able to attach multiple text and binary enclosures to mail messages.

Traceability:
Priority 1

3.2.3.9 The Electronic Mail software shall be able to import ASCII text into the body of a message.

Traceability:
Priority 1

3.2.3.10 The Electronic Mail software shall provide the option for the sender to obtain a receipt when a message is delivered to or viewed by each recipient.

Traceability:
Priority 1

3.2.3.11 The Electronic Mail software shall provide the capability to create, add, delete, and modify private distribution lists.

Traceability:
Priority 1

3.2.3.12 The Electronic Mail software shall be able to announce mail deliveries while the user is active in another application.

Traceability:
Priority 1

3.2.3.13 The Electronic Mail software shall provide group accounts so more than one user can access the account simultaneously.

Traceability:
Priority 1

3.2.3.14 The Electronic Mail software shall provide the capability to access both personal and group accounts from a single user ID.

Traceability:
Priority 1

3.2.3.15 The Electronic Mail software shall allow the user to print a message.

Traceability:
Priority 1

3.2.3.16 The Electronic Mail software shall provide a message in-box window with the following information: originator, subject, date sent, and time sent.

Traceability:
Priority 1

3.2.3.17 The Electronic Mail software shall provide the ability to save enclosures with mail files.
Traceability:
Priority 1

3.2.3.18 The Electronic Mail software shall provide the capability to detach and store enclosures as separate files.
Traceability:
Priority 1

3.2.3.19 The Electronic Mail software shall be able to store mail on centralized mail servers.
Traceability:
Priority 1

3.2.3.20 The Electronic Mail software shall provide the capability for a user to save messages and enclosures external to the mail system.
Traceability:
Priority 1

3.2.3.21 The Electronic Mail software shall provide the capability to create and maintain a centralized list of mail addressees to include addressees from external mail domains(global list).
Traceability:
Priority 1

3.2.3.22 The Electronic Mail software shall provide a search feature for the global list based on a username.
Traceability:
Priority 1

3.2.3.23 The Electronic Mail software shall provide an API (Application Programming Interface) with editing and debugging support.
Traceability:
Priority 1

3.2.3.24 The Electronic Mail software shall provide the capability for users to forward their mail-boxes to another account.
Traceability:
Priority 1

3.2.3.25 The Electronic Mail software shall provide a user-definable notification to a sender that the user is unavailable to review mail.
Traceability:
Priority 1

3.2.3.26 The Electronic Mail software shall provide the user with an option to save a message to a mail folder when it is sent.
Traceability:
Priority 1

3.2.3.27 The Electronic Mail software shall provide the capability to sort and search mail folders for the priority of message, sender name, subject, viewed status (new, unread, read, deleted), and date.
Traceability:
Priority 1

3.2.3.28 The Electronic Mail software shall be able to facilitate viewing enclosures by starting the appropriate application (e.g., word processor, spreadsheet).
Traceability:
Priority 1

3.2.3.29 The Electronic Mail software shall provide the capability to have aliases for users.
Traceability:
Priority 1

3.2.3.30 The Electronic Mail software shall be able to support a macro language within the application.
Traceability:
Priority 1

3.2.3.31 The Electronic Mail software shall provide the system administrator with the capability to suspend the ability of a user to send messages.
Traceability:
Priority 1

3.2.3.32 The Electronic Mail software shall be able to support the coordination of memos and documents.
Traceability:
Priority 1

3.2.3.33 The Electronic Mail software shall allow the user to prepare a document for editing and release by another person.
Traceability:
Priority 1

3.2.3.34 The Electronic Mail software shall provide the capability to archive and retrieve all messages sent.
Traceability:
Priority 1

3.2.3.35 The Electronic Mail software shall provide the capability to support the following profile-based electronic mail requirements. A profile defines a set of system functions or capabilities which are needed by the user to perform his/her functional activity, e.g., Watch Officer. A user may be possess one or more profiles and may have one or more of these profiles active during the user's login session. The profile may require that the user assuming that profile be able to create, send, receive and reply to electronic mail addressed to that profile.
Traceability:
Priority 1

3.2.3.35.1 The Electronic Mail software shall provide the capability when creating an E-mail message to select the originator's address to be one of the user's active profile(s).
Traceability:
Priority 1

3.2.3.35.2 The Electronic Mail software shall provide the capability to address E-mail messages to a profile.
Traceability:
Priority 1

3.2.3.35.3 The Electronic Mail software shall provide the capability to route E-mail messages to a profile
Traceability:
Priority 1

3.2.3.35.4 The Electronic Mail software shall provide a search feature for the global list based on a profile name.
Traceability:
Priority 1

3.2.3.35.5 The Electronic Mail software shall provide the capability when replying to a profile-based E-mail message to have the default return address be the profile for which the message was received.

Traceability:
Priority 1

3.2.3.35.6 The Electronic Mail software shall provide the capability to read profile-based E-mail messages received by users active in that profile.

Traceability:
Priority 1

3.2.3.35.7 The Electronic Mail software shall provide the capability to notify a user upon receipt of a profile-based E-mail messages by users active in that profile.

Traceability:
Priority 1

3.2.3.36 The Electronic Mail software shall provide the capability to send E-mail to multiple addresses to include users, mail lists, mail aliases and profiles.

Traceability:
Priority 1

3.2.3.37 The Electronic Mail software shall provide the capability to route E-mail to multiple addresses to include users, mail lists, mail aliases and profiles.

Traceability:
Priority 1

3.2.3.38 The Electronic Mail software shall provide the capability to address E-mail messages to any mail address to include an address not available in the global directory .

Traceability:
Priority 1

3.2.3.39 The Electronic Mail software shall provide the capability to route E-mail messages to any mail address to include an address not available in global directory.

Traceability:
Priority 1

OA 3.2.4 Presentation Graphics

The following section contains functional requirements for presentation graphics office automation products in the DII COE.

3.2.4.1 The Presentation Graphics software shall support the import and export of the following file formats:

a. Computer Graphics Metafile (CGM)

Traceability:
Priority 1

b. Tagged Image File Format (TIFF) R and G

Traceability:
Priority 1

c. Encapsulated PostScript (EPS)

Traceability:
Priority 1

d. Graphics Interchange Format (GIF)

Traceability:
Priority 1

e. Portable Bitmap (PBM)

Traceability:
Priority 1

f. PC Paintbrush (PCX)

Traceability:
Priority 1

g. ASCII Text

Traceability:
Priority 1

3.2.4.2 The Presentation Graphics software shall support the import of the following file formats:

a. FrameMaker Interchange Format (MIF)

Traceability:
Priority 1

b. Microsoft Paint (MSP)

Traceability:
Priority 1

c. Lotus (PIC)

Traceability:
Priority 1

d. MacPaint (PNTG)

Traceability:
Priority 1

e. PowerPoint V3 and V4

Traceability:
Priority 1

f. WordPerfect Graphics (WPG)

Traceability:
Priority 1

g. Sun Raster

Traceability:
Priority 1

h. X-Window Dump (XWD)

Traceability:
Priority 1

i. X-Window bitmap (Xbitmap)

Traceability:
Priority 1

j. Lotus WKS/WK1/WK3 spreadsheets

Traceability:
Priority 1

3.2.4.3 The Presentation Graphics software shall provide symbols for flow charts and maps and a common clip art library.

Traceability:
Priority 1

3.2.4.4 The Presentation Graphics software shall be able to resize, rescale, flip, or rotate objects from the object libraries.

Traceability:
Priority 1

3.2.4.5 The Presentation Graphics software shall provide the capability for on-line color changes to any on-screen object.

Traceability:
Priority 1

3.2.4.6 The Presentation Graphics software shall allow the user to position more than one graphic image on one screen.

Traceability:
Priority 1

3.2.4.7 The Presentation Graphics software shall provide the capability to generate

a. pie charts and exploded pie charts in both 2D and 3D directly from data without a human drawing effort

Traceability:
Priority 1

b. horizontal, vertical, and stacked vertical bar graphs in both 2D and 3D directly from data without a drawing effort.

Traceability:
Priority 1

c. vertical and horizontal line graphs in both 2D and 3D directly from data without a drawing effort.

Traceability:
Priority 1

d. scatter plot diagrams in both 2D and 3D directly from data without a drawing effort.

Traceability:
Priority 1

3.2.4.8 The Presentation Graphics software shall provide at least

a. seven distinct colors

Traceability:
Priority 1

b. seven distinct line patterns

Traceability:
Priority 1

c. seven distinct shading patterns

Traceability:
Priority 1

3.2.4.9 The Presentation Graphics software shall provide definable color vectors.

Traceability:
Priority 1

3.2.4.10 The Presentation Graphics software shall provide independent and grouped scaling of objects.

Traceability:
Priority 1

3.2.4.11 The Presentation Graphics software shall provide the capability to display, snap to and print a graph grid.

Traceability:
Priority 1

3.2.4.12 The Presentation Graphics software shall provide rulers.

Traceability:
Priority 1

3.2.4.13 The Presentation Graphics software shall provide user-selectable scales in inches, centimeters, and points for grids and rulers.

Traceability:
Priority 1

3.2.4.14 The Presentation Graphics software shall allow the user to label the x-axis and y-axis with user-provided horizontal and vertical labels.

Traceability:
Priority 1

3.2.4.15 The Presentation Graphics software shall permit display and editing in portrait and landscape modes.

Traceability:
Priority 1

3.2.4.16 The Presentation Graphics software shall provide for flipping and rotation of the x- and y-axis of the display chart or graph.

Traceability:
Priority 1

3.2.4.17 The Presentation Graphics software shall allow the user to enter at least three header lines of 40 characters each and three footer lines of 40 characters each.

Traceability:
Priority 1

3.2.4.18 The Presentation Graphics software shall allow automatic page numbering to appear separately from the footer on each graphic image.

Traceability:
Priority 1

3.2.4.19 The Presentation Graphics software shall allow the user to select for each header line and footer line the character size, color, typeface, and justification.

Traceability:
Priority 1

3.2.4.20 The Presentation Graphics software shall provide the capability for the user to select size and type of scale (linear and logarithmic) and points for grids and rulers.

Traceability:
Priority 1

3.2.4.21 The Presentation Graphics software shall be able to edit, move, copy, delete, and undelete objects on screen.

Traceability:
Priority 1

3.2.4.22 The Presentation Graphics software shall provide the capability for the user to store, edit, delete, and retrieve images and their parameters and settings.

Traceability:
Priority 1

3.2.4.23 The Presentation Graphics software shall provide the capability to print and plot graphs in portrait and landscape modes.

Traceability:
Priority 1

3.2.4.24 The Presentation Graphics software shall be able to plot to an HPGL4 plotter or plotter that emulates HPGL4.

Traceability:
Priority 1

3.2.4.25 The Presentation Graphics software shall permit a print preview of the entire page of graphics images on screen.

Traceability:
Priority 1

3.2.4.26 The Presentation Graphics software shall allow the user to select page length and width, the of number of copies to print, draft- or high-quality printing, color or black and white print output.

Traceability:
Priority 1

3.2.4.27 The Presentation Graphics software shall allow the user to select and manage printers.

Traceability:
Priority 1

3.2.4.28 The Presentation Graphics software shall provide the capability to present the same data in different chart formats without rekeying the data.

Traceability:
Priority 1

3.2.4.29 The Presentation Graphics software shall provide the capability to delete individual objects or object groups selectively without having to recreate the entire display.

Traceability:
Priority 1

3.2.4.30 The Presentation Graphics software shall provide slide show and slide manager capabilities.

Traceability:
Priority 1

3.2.4.31 The Presentation Graphics software shall provide the capability to add text and special characters in selectable typefaces in point sizes from 8 to 48 points.

Traceability:
Priority 1

3.2.4.32 The Presentation Graphics software shall draw lines (including freehand), rectangles, arcs, circles, ellipses, and polygons in continuously variable styles and positions.

Traceability:
Priority 1

3.2.4.33 The Presentation Graphics software shall provide the capability to resize, rescale, and flip objects vertically or horizontally.

Traceability:
Priority 1

3.2.4.34 The Presentation Graphics software shall permit alignment of objects and text vertically or horizontally.

Traceability:
Priority 1

3.2.4.35 The Presentation Graphics software shall provide the capability for batch printing of multiple slides and graphics files.

Traceability:
Priority 1

3.2.4.36 The Presentation Graphics software shall provide line styles options for thickness and arrowheads.

Traceability:
Priority 1

3.2.4.37 The Presentation Graphics software shall provide for cross-hatch patterns, foreground color, and background color.

Traceability:
Priority 1

3.2.4.38 The Presentation Graphics software shall provide at least seven different color fill options for both foreground and background.

Traceability:
Priority 1

3.2.4.39 The Presentation Graphics software shall provide text style options for bold, italic, underline, justification, special characters, and borders and grid options.

Traceability:
Priority 1

3.2.4.40 The Presentation Graphics software shall provide a pixel editor.

Traceability:
Priority 1

3.2.4.41 The Presentation Graphics software shall be able to group and ungroup selected objects into other temporary objects.

Traceability:
Priority 1

3.2.4.42 The Presentation Graphics software shall provide the capability to input digitized data.

Traceability:
Priority 1

3.2.4.43 The Presentation Graphics software shall provide the capability to select an object, select multiple objects and select all objects and deselect all objects.

Traceability:
Priority 1

3.2.4.44 The Presentation Graphics software shall provide the capability for the select function to cycle through objects.

Traceability:
Priority 1

3.2.4.45 The Presentation Graphics software shall provide the capability for adding or removing objects from currently selected groups.

Traceability:
Priority 1

3.2.4.46 The Presentation Graphics software shall provide the capability for selecting interior or exterior objects.

Traceability:
Priority 1

3.2.4.47 The Presentation Graphics software shall be able to change the displayed order of overlapping objects (front to back) by moving the object to the front or back or in either direction one object at a time.

Traceability:
Priority 1

3.2.4.48 The Presentation Graphics software shall provide the capability for the user to be able to zoom in and out repetitively.
Traceability:
Priority 1

3.2.4.49 The Presentation Graphics software shall allow the user to scroll through the zoomed graphic.
Traceability:
Priority 1

3.2.4.50 The Presentation Graphics software shall enable the user to rearrange objects through rotation(0 degrees through 360 degrees).
Traceability:
Priority 1

3.2.4.51 The Presentation Graphics software shall enable the user to set priority for background and foreground.
Traceability:
Priority 1

3.2.4.52 The Presentation Graphics software shall enable the user to rearrange objects through an alignment function (left, right, horizontal, vertical, top, bottom, and center).
Traceability:
Priority 1

3.2.4.53 The Presentation Graphics software shall be able to edit object and text size and color.
Traceability:
Priority 1

3.2.4.54 The Presentation Graphics software shall be able to fill objects with user-selectable patterns.
Traceability:
Priority 1

3.2.4.55 The Presentation Graphics software shall be able to modify line thickness, style, and weight.
Traceability:
Priority 1

3.2.4.56 The Presentation Graphics software shall be able to edit text, special characters, text point size and images.
Traceability:
Priority 1

3.2.4.57 The Presentation Graphics software shall provide a screen refresh capability.
Traceability:
Priority 1

OA 3.2.5 Spreadsheet

The following section contains functional requirements for spreadsheet office automation products in the DII COE.

3.2.5.1 The Spreadsheet software shall provide business graphics to include pie charts, line graphs, and vertical and horizontal bar graphs.
Traceability:
Priority 1

3.2.5.2 The Spreadsheet software shall provide at least 1000 rows and 256 columns.
Traceability:
Priority 1

3.2.5.3 The Spreadsheet software shall display the currently selected row and column position.
Traceability:
Priority 1

3.2.5.4 The Spreadsheet software shall be able to use relative and absolute references to other cells.
Traceability:
Priority 1

3.2.5.5 The Spreadsheet software shall be able to name a specified range of cells and to view, reference, erase, copy, and move the range by referring to the range name.
Traceability:
Priority 1

3.2.5.6 The Spreadsheet software shall be able to protect specific cells and groups of cells from global commands.
Traceability:
Priority 1

3.2.5.7 The Spreadsheet software shall be able to protect data from editing by cell, row, column, range of cells, as well as the whole spreadsheet with the ability to enable and disable edit protection.
Traceability:
Priority 1

3.2.5.8 The Spreadsheet software shall be able to adjust column width from the default value to the maximum width of the spreadsheet.
Traceability:
Priority 1

3.2.5.9 The Spreadsheet software shall permit display of text in excess of cell length when such display would not obscure other data.
Traceability:
Priority 1

3.2.5.10 The Spreadsheet software shall be able to select and display the current date in several user-selectable formats.
Traceability:
Priority 1

3.2.5.11 The Spreadsheet software shall support a macro programming language.
Traceability:
Priority 1

3.2.5.12 The Spreadsheet software shall be able to record a series of commands as a macro for subsequent editing and execution by a single command or function.
Traceability:
Priority 1

3.2.5.13 The Spreadsheet software shall allow a user to insert a pause in a macro command file for text entry while the macro is running.
Traceability:
Priority 1

3.2.5.14 The Spreadsheet software shall be able to retrieve a spreadsheet file and insert it into the one currently in use.
Traceability:
Priority 1

3.2.5.15 The Spreadsheet software shall be able to retrieve a spreadsheet file and overwrite the one currently in use.

Traceability:
Priority 1

3.2.5.16 The Spreadsheet software shall be able to save part or all of a spreadsheet as a separate file without altering the original file.

Traceability:
Priority 1

3.2.5.17 The Spreadsheet software shall permit the user to select an alternate default directory for spreadsheet file storage.

Traceability:
Priority 1

3.2.5.18 The Spreadsheet software shall permit the user to display a list of all spreadsheet files in a directory.

Traceability:
Priority 1

3.2.5.19 The Spreadsheet software shall be able to display and print a graph.

Traceability:
Priority 1

3.2.5.20 The Spreadsheet software shall be able to print the spreadsheet in portrait and landscape orientation in continuous or manual feed modes.

Traceability:
Priority 1

3.2.5.21 The Spreadsheet software shall provide variable typefaces and point sizes.

Traceability:
Priority 1

3.2.5.22 The Spreadsheet software shall provide user-selectable typeface enhancements to include bold, italics, and underline.

Traceability:
Priority 1

3.2.5.23 The Spreadsheet software shall permit user-defined page headers and footers.

Traceability:
Priority 1

3.2.5.24 The Spreadsheet software shall allow the user to set margins.

Traceability:
Priority 1

3.2.5.25 The Spreadsheet software shall permit the user to adjust the following output parameters: cell range, page range, line spacing, and color or black and white printing.

Traceability:
Priority 1

3.2.5.26 The Spreadsheet software shall permit the user to select from the following numeric data formats: currency, scientific, integer, negative, percent, dates, and text.

Traceability:
Priority 1

3.2.5.27 The Spreadsheet software shall permit the user to select the number of digits displayed after the decimal point.

Traceability:
Priority 1

3.2.5.28 The Spreadsheet software shall be able to scroll horizontally and vertically by line, page, and screen.

Traceability:
Priority 1

3.2.5.29 The Spreadsheet software shall be able to lock and unlock row and column headings while scrolling data.

Traceability:
Priority 1

3.2.5.30 The Spreadsheet software shall be able to modify, copy, and delete spreadsheet data and spreadsheet structure separately.

Traceability:
Priority 1

3.2.5.31 The Spreadsheet software shall perform mathematical operations on integer and real numbers to include addition, subtraction, multiplication, division, integer function (convert real number to an integer), absolute value calculations, rounding, and combinations of the above.

Traceability:
Priority 1

3.2.5.32 The Spreadsheet software shall perform string operations to include concatenation, sub-string, trim leading and trailing spaces, convert to upper and lower case, convert a string to a value, and convert a value to a string.

Traceability:
Priority 1

3.2.5.33 The Spreadsheet software shall perform mathematical operations to include logarithmic function, exponentiation, trigonometric functions, modulus, reciprocal, square root, summation, and random number selection.

Traceability:
Priority 1

3.2.5.34 The Spreadsheet software shall perform statistical operations to include linear regression, variance, standard deviation, mean, median, average, sum, minimum, maximum, and count.

Traceability:
Priority 1

3.2.5.35 The Spreadsheet software shall perform relational operations to include greater than, greater than or equal to, less than, less than or equal to, equal to, and not equal to.

Traceability:
Priority 1

3.2.5.36 The Spreadsheet software shall perform logical operations to include AND, OR, and NOT.

Traceability:
Priority 1

3.2.5.37 The Spreadsheet software shall perform combinations of arithmetic, relational, and logical operations.

Traceability:
Priority 1

3.2.5.38 The Spreadsheet software shall provide financial operations to include computing present and future values and depreciation, and calculating amortization tables, rates of return, and annuities.

Traceability:
Priority 1

3.2.5.39 The Spreadsheet software shall be able to specify how to recalculate the entire spreadsheet: manually or automatically.

Traceability:
Priority 1

3.2.5.40 The Spreadsheet software shall provide absolute and relative addressing when the user copies or moves data.

Traceability:
Priority 1

3.2.5.41 The Spreadsheet software shall be able to copy, move, and erase cells, rows, columns, and ranges of cells.

Traceability:
Priority 1

3.2.5.42 The Spreadsheet software shall permit user-defined justification for values and text to include left, right, or center justified.

Traceability:
Priority 1

3.2.5.43 The Spreadsheet software shall be able to reformat data by cell, row, column, range of cells, and the whole spreadsheet.

Traceability:
Priority 1

3.2.5.44 The Spreadsheet software shall be able to insert and delete rows and columns.

Traceability:
Priority 1

3.2.5.45 The Spreadsheet software shall be able to sort columns and multiple columns containing numbers and text in ascending and descending order using a primary key and a secondary key.

Traceability:
Priority 1

3.2.5.46 The Spreadsheet software shall be able to import and export data in the following file formats:

a. ASCII Text

Traceability:
Priority 1

b. Lotus WKS/WK1/WK3 spreadsheets

Traceability:
Priority 1

c. Microsoft Excel V5.0

Traceability:
Priority 1

d. Data Interchange Format (DIF)

Traceability:
Priority 1

3.2.5.47 The Spreadsheet software shall provide an undo function of at least one prior command.

Traceability:
Priority 1

3.2.5.48 The Spreadsheet software shall be capable of maintaining at least three linked spreadsheets in memory and at least five linked spreadsheets on disk.

Traceability:
Priority 1

3.2.5.49 The Spreadsheet software shall be able to create more than one report format for a given spreadsheet.

Traceability:
Priority 1

3.2.5.50 The Spreadsheet software shall be able to enable and disable page numbering for the spreadsheet.

Traceability:
Priority 1

3.2.5.51 The Spreadsheet software shall be able to calculate the number of occurrences of user-defined values or strings within a user-defined range.

Traceability:
Priority 1

3.2.5.52 The Spreadsheet software shall be able to store variable-length text strings in individual cells.

Traceability:
Priority 1

3.2.5.53 The Spreadsheet software shall provide basic database command features.

Traceability:
Priority 1

3.2.5.54 The Spreadsheet software shall provide basic report generation features.

Traceability:
Priority 1

3.2.5.55 The Spreadsheet software shall provide display and print formatting options to include line drawing, grid range selection, and cell borders.

Traceability:
Priority 1

OA 3.2.6 Drawing and Illustration

The following section contains functional requirements for drawing and illustration office automation products in The DII COE.

3.2.6.1 The Drawing/Illustration software shall create new graphics with initial controls for page size, bleed, and target printer resolution user-selectable with a range from 300 to 2540 dpi.

Traceability:
Priority 1

3.2.6.2 The Drawing/Illustration software shall provide the ability to set unit of measure preference in points, picas, inches, decimal inches, millimeters and centimeters.

Traceability:
Priority 1

3.2.6.3 The Drawing/Illustration software shall provide the capability to save as a template for subsequent use in creating graphics with similar color, layer, and attribute listings.

Traceability:
Priority 1

3.2.6.4 The Drawing/Illustration software shall provide the capability to import and export the following file formats:

a. Computer Graphics Metafile (CGM)

Traceability:
Priority 1

b. Tagged Image File Format (TIFF) R and G

Traceability:
Priority 1

c. Encapsulated PostScript (EPS)

Traceability:
Priority 1

d. Graphics Interchange Format (GIF)

Traceability:
Priority 1

e. Portable Bitmap (PBM)

Traceability:
Priority 1

f. PC Paintbrush (PCX)

Traceability:
Priority 1

3.2.6.5 The Drawing/Illustration software shall provide the capability to import the following file formats:

a. FrameMaker Interchange Format (MIF)

Traceability:
Priority 1

b. Microsoft Paint (MSP)

Traceability:
Priority 1

c. Lotus (PIC)

Traceability:
Priority 1

d. MacPaint (PNTG)

Traceability:
Priority 1

e. PowerPoint V3 and V4

Traceability:
Priority 1

f. WordPerfect Graphics (WPG)

Traceability:
Priority 1

g. Sun Raster

Traceability:
Priority 1

h. X-Window Dump (XWD)

Traceability:
Priority 1

i. X-Window bitmap (Xbitmap)

Traceability:
Priority 1

j. Lotus WKS/WK1/WK3 spreadsheets

Traceability:
Priority 1

k. International Graphics Exchange Specification (IGES)

Traceability:
Priority 1

3.2.6.6 The Drawing/Illustration software shall support the use of the Joint Photographic Experts Group (JPEG) and CCITT Group 3 and 4 recommendations for compression of binary data files.

Traceability:
Priority 1

3.2.6.7 The Drawing/Illustration software shall provide mouse-driven tools to create lines.

Traceability:
Priority 1

3.2.6.8 The Drawing/Illustration software shall provide mouse-driven tools to create bezier curves, circles, squares, rounded corner squares, square and rounded corner rectangles, ellipses, and open and closed polygons containing up to 1000 editable nodes or points.

Traceability:
Priority 1

3.2.6.9 The Drawing/Illustration software shall provide user controls for editing color, stroke, fill, line weight, and x,y position.

Traceability:
Priority 1

3.2.6.10 The Drawing/Illustration software shall provide the ability to fill any graphic or textual element with solid color/tint, graduated fill, and pattern fill.

Traceability:
Priority 1

3.2.6.11 The Drawing/Illustration software shall provide the ability to group and ungroup any combination of textual or graphic elements.

Traceability:
Priority 1

3.2.6.12 The Drawing/Illustration software shall provide the capability to nest grouping of elements up to 25 levels (e.g., groups within a group).

Traceability:
Priority 1

3.2.6.13 The Drawing/Illustration software shall provide the ability to join and split elements.

Traceability:
Priority 1

3.2.6.14 The Drawing/Illustration software shall provide controls for vertical and horizontal alignment of any combination of graphic or textual elements with user selection of element edge to be aligned.

Traceability:
Priority 1

3.2.6.15 The Drawing/Illustration software shall provide controls for vertical and horizontal alignment of any combination of graphic or textual elements with user selection of element center to be aligned.

Traceability:
Priority 1

3.2.6.16 The Drawing/Illustration software shall provide controls for vertical and horizontal alignment of any combination of graphic or textual elements with user selection of element width and height to be aligned.

Traceability:
Priority 1

3.2.6.17 The Drawing/Illustration software shall provide controls for equal distribution of any combination of graphic or textual elements to be aligned.

Traceability:
Priority 1

3.2.6.18 The Drawing/Illustration software shall provide controls for equal distribution of any combination of graphic or textual elements with user selection of element center to be aligned.

Traceability:
Priority 1

3.2.6.19 The Drawing/Illustration software shall provide controls for equal distribution of any combination of graphic or textual elements with user selection of element width and height to be aligned.

Traceability:
Priority 1

3.2.6.20 The Drawing/Illustration software shall provide node or point editing capability to include conversion of nodes or groups of nodes to corner type nodes.

Traceability:
Priority 1

3.2.6.21 The Drawing/Illustration software shall provide node or point editing capability to include conversion of nodes or groups of nodes to curve type nodes and connector type nodes.

Traceability:
Priority 1

3.2.6 22 The Drawing/Illustration software shall provide the ability to automatically close or join non-touching or non-closed paths.

Traceability:
Priority 1

3.2.6.23 The Drawing/Illustration software shall provide the capability to fill and stroke graphic and text elements with user-defined tints and colors.

Traceability:
Priority 1

3.2.6.24 The Drawing/Illustration software shall provide the capability to fill graphic and text elements with user-defined patterns and line weights.

Traceability:
Priority 1

3.2.6.25 The Drawing/Illustration software shall provide a mouse-driven tool and key-combination to perform the following actions:

a. fill elements

Traceability:
Priority 1

b. select areas

Traceability:
Priority 1

c. draw elements

Traceability:
Priority 1

d. delete elements

Traceability:
Priority 1

e. replicate elements

Traceability:
Priority 1

f. blend elements

Traceability:
Priority 1

g. zoom

Traceability:
Priority 1

h. add textual elements

Traceability:
Priority 1

3.2.6.26 The Drawing/Illustration software shall provide for textual and graphic element mirroring both horizontally and vertically.

Traceability:
Priority 1

3.2.6.27 The Drawing/Illustration software shall provide for 360-degree rotation of textual and graphic elements at one-degree increments.

Traceability:
Priority 1

3.2.6.28 The Drawing/Illustration software shall provide the ability to add text with user controls for font, point size, leading, letter spacing, word spacing, kerning, horizontal scaling, justification (alignment),rotation, baseline shift, and color.

Traceability:
Priority 1

3.2.6.29 The Drawing/Illustration software shall provide the ability to convert text to paths and manipulate as any other path.

Traceability:
Priority 1

3.2.6.30 The Drawing/Illustration software shall provide the ability to align text to a path.

Traceability:
Priority 1

3.2.6.31 The Drawing/Illustration software shall provide the ability to define layers for an illustration.

Traceability:
Priority 1

3.2.6.32 The Drawing/Illustration software shall provide the ability for the user to place any graphic element on any defined layer with controls for positioning of said element to include front, back, and specific position within the specified layer.

Traceability:
Priority 1

3.2.6.33 The Drawing/Illustration software shall provide the ability for the user to place any text element on any defined layer with controls for positioning of said element to include front, back, and specific position within the specified layer.

Traceability:
Priority 1

3.2.6.34 The Drawing/Illustration software shall provide the ability to scale and skew elements or groups of elements.

Traceability:
Priority 1

3.2.6.35 The Drawing/Illustration software shall provide for user definition of colors to include process and PMS colors.

Traceability:
Priority 1

3.2.6.36 The Drawing/Illustration software shall provide a utility for locking grids or guides in place.

Traceability:
Priority 1

3.2.6.37 The Drawing/Illustration software shall provide for the toggling of snapping functions.

Traceability:
Priority 1

3.2.6.38 The Drawing/Illustration software shall provide the ability to toggle between preview of illustrations with full representation of fills, text, colors, and line enhancements or view display of path outlines and text only without fills, color or line enhancements.

Traceability:
Priority 1

3.2.6.39 The Drawing/Illustration software shall provide for the toggling of rulers, grids, and guides.

Traceability:
Priority 1

3.2.6.40 The Drawing/Illustration software shall provide for dynamic zooming capability allowing user to marquee select desired area for zoom with automatic resizing of the selected area to the display.

Traceability:
Priority 1

3.2.6.41 The Drawing/Illustration software shall, through a menu, allow the user to have the ability to zoom from 12.5 percent to 800 percent at user-definable increments and have the ability to "fit in window" the entire illustration.

Traceability:
Priority 1

3.2.6.42 The Drawing/Illustration software shall provide the capability to produce process color separation output in the primary printing components(Cyan Magenta Yellow K=black - CMYK).

Traceability:
Priority 1

3.2.6.43 The Drawing/Illustration software shall ensure that the output of Pantone Matching System colors must be user selectable.

Traceability:
Priority 1

3.2.6.44 The Drawing/Illustration software shall allow for output of one separation for each Pantone Matching System color or conversion of the PMS color to the CMYK equivalent.
Traceability:
Priority 1

3.2.6.45 The Drawing/Illustration software shall allow for composite printing of images in color, and black-and-white
Traceability:
Priority 1

3.2.6.46 The Drawing/Illustration software shall provide the ability to output graphics at full size with control strips, crop marks and registration marks.
Traceability:
Priority 1

3.2.6.47 The Drawing/Illustration software shall provide user selectable screen rulings for halftone output ranging from 50 lpi to 200 lpi.
Traceability:
Priority 1

3.2.6.48 The Drawing/Illustration software shall provide user selectable screen angles for halftone separation output up to 360-degrees at one-degree increments.
Traceability:
Priority 1

3.2.6.49 The Drawing/Illustration software shall provide trapping functions during output including chokes and spreads to be controlled both automatically and by user definition.
Traceability:
Priority 1

3.2.6.50 The Drawing/Illustration software shall provide output over print controls at both the element level and ink level.
Traceability:
Priority 1

3.2.6.51 The Drawing/Illustration software shall support Adobe PostScript Level 2 output to devices ranging from 300 dpi black and white and color printers to 2540 dpi laser image setters.
Traceability:
Priority 1

3.2.6.52 The Drawing/Illustration software shall provide editing capability to undo at least the most recently performed function.
Traceability:
Priority 1

3.2.6.53 The Drawing/Illustration software shall provide the ability to cut, copy, paste, and duplicate within a graphic and from one graphic to another.
Traceability:
Priority 1

3.2.6.54 The Drawing/Illustration software shall provide the ability to move graphic elements or groups of elements with a mouse using the drag and drop technique and by entry of x,y values in a dialog box.
Traceability:
Priority 1

3.2.6.55 The Drawing/Illustration software shall be capable of specifying point size of text for greeking during display.

Traceability:
Priority 1

3.2.6.56 The Drawing/Illustration software shall be capable of controlling high- and low-resolution display of imported images.

Traceability:
Priority 1

3.2.6.57 The Drawing/Illustration software shall be capable of toggling the display of curve and node handles used for manipulation of bezier curves.

Traceability:
Priority 1

3.2.6.58 The Drawing/Illustration software shall be capable of joining non-touching and broken paths.

Traceability:
Priority 1

3.2.6.59 The Drawing/Illustration software shall be able to set default graphic element attributes.

Traceability:
Priority 1

3.2.6.60 The Drawing/Illustration software shall be capable of setting color for guides and grids.

Traceability:
Priority 1

3.2.6.61 The Drawing/Illustration software shall be capable of selecting a user-defined distance for cursor key control.

Traceability:
Priority 1

3.2.6.62 The Drawing/Illustration software shall be capable of selecting a user-defined snap-to distance for all snap functions.

Traceability:
Priority 1

3.2.6 63 The Drawing/Illustration software shall provide for a multiple level undo and redo function.

Traceability:
Priority 1

OL 3.2 On-Line Support Services Functional Requirements

The On-Line Support services provide users the capability to access help from any screen or window within the GCCS COE system operating on any approved platform. It is intended to provide comprehensive help to users in every aspect of the system implementation.

On-Line Help provides a multitude of services including task specific instruction, search options, and on-screen demos. It is intended to give the user access to specific information.

On-Line Job Planning provides descriptions of tasks involved, and required order of execution in correct job completion. This service provides help at a greater level of detail than On-Line Help.

On-Line Reference gives the user access to all information contained in operator guides. This allows the user to browse for general information in a comprehensive electronic version of all system and operator manuals.

Computer-Based Instruction provides informal tutorials to allow a deeper level of understanding of system operation.

OL 3.2.1 Common Requirements

This section states the requirements which must be met by all On-Line services. These requirements are necessary to establish a commonality between the four services. The sections following state additional requirements relevant to each service individually.

OL 3.2.1.1 The On-Line Support services shall allow users to establish focus on a certain object without activating that object. A user must be able to gain functional or descriptive information about an icon or button without actuating its execution.

Traceability:
Priority 1

OL 3.2.1.2 The On-Line Support services shall provide an information bar at the bottom of all primary and secondary task-related windows displaying general descriptions and functional descriptions of an item on which the user establishes focus. This will inform the operator of the resulting software response if the object were invoked, and, in cases requiring user input in a certain field, what input is to be supplied and its format.

Traceability:
Priority 1

OL 3.2.1.3 The On-Line Support services shall provide documentation of references to address anticipated user questions and should not be addressed from the perspective of the developer.

Traceability:
Priority 1

OL 3.2.1.4 The On-Line Support services shall provide a help window for all application windows.

Traceability:
Priority 1

OL 3.2.1.5 The On-Line Support services shall provide window-level help through pull-down menus.

Traceability:
Priority 1

OL 3.2.1.6 The On-Line Support services shall provide object-level help through a help key (e.g., F1).

Traceability:
Priority 1

OL 3.2.2 On-Line Help

OL 3.2.2.1 The On-Line Help service shall be available for all potential modes of a window. For example, if the default mode of a window permits test editing, but also has a “print preview” mode, help for this window will cover capabilities/features available in both modes.

Traceability:
Priority 1

OL 3.2.2.2 On-Line Help instructions shall be printable.

Traceability:
Priority 1

OL 3.2.2.3 The On-Line Help service shall keep the help window displayed but inactive while the user executes the instructions provided in the window. This eliminates the need for the user to memorize the instructions while completing the inquired task.

Traceability:
Priority 1

OL 3.2.3 On-Line Job Planning

OL 3.2.3.1 The On-Line Help service shall provide the user with step-by-step instruction on how to perform a specific task relating to the user's current job.

Traceability:
Priority 1

OL 3.2.3.2 The On-Line Help service shall identify all obscure intermediate steps essential to the process of completing a task. This will give the user the ability to perform tasks involving transitional steps which may not be obvious.

Traceability:
Priority 1

OL 3.2.3.3 The On-Line Help service shall provide on-screen procedural demonstrations of task execution. This feature is intended to be a hands-off illustration of how tasks are performed and must allow the user to repeat the demonstration at the user's discretion.

Traceability:
Priority 1

OL 3.2.4 On-Line Reference

OL 3.2.4.1 The On-Line Documentation service shall provide the user with the ability to search for information by subject or key words.

Traceability:
Priority 1

OL 3.2.4.2 The On-Line Documentation service shall provide the user with cross-referencing abilities between applications, including hypertext capabilities. This will allow the user to locate pertinent information that may not be presented in order.

Traceability:
Priority 1

OL 3.2.4.3 The On-Line Documentation service shall provide a global index through which the user may perform topical searches by selecting entries given within the index. This allows the user another method of searching through hypertext techniques.

Traceability:
Priority 2

OL 3.2.5 Computer Based Instruction (CBI)

OL 3.2.5.1 The Computer Based Instruction service shall provide step-by-step tutoring to users demonstrating specific task execution and processes for job implementation. This feature is a hands-on version of requirement OL 3.2.3.3, allowing users to actually perform the steps being demonstrated.

Traceability:
Priority 1

OL 3.2.5.2 The Computer Based Instruction service shall provide tutorial lessons which will be presented to the user in an organized and progressive manner, beginning with basic operations and advancing through higher-level operations at a pace determined by the user.

Traceability:
Priority 2

OL 3.2.5.3 The Computer Based Instruction service shall provide an option to save training sessions which will allow users to continue the training process from previous sessions.

Traceability:
Priority 2

OL 3.2.5.4 The Computer Based Instruction service shall provide the user with a performance evaluation using a rating system based on feedback from tutorial lessons.

Traceability:
Priority 2

OL 3.2.6 Requirements Submitted by the Army

3.2.6.1 FAAD requires the ability to allow the operator to create training scenarios. Necessary for the following exercises:

- Create Exercise Initiation

  Traceability: ARMY, 20 July 1996
  Priority ???

- Fire Retrieval

  Traceability: ARMY, 20 July 1996
  Priority ???

- Scenario Generation

  Traceability: ARMY, 20 July 1996
  Priority ???

- Prescript Options Menu

  Traceability: ARMY, 20 July 1996
  Priority ???

- Modify Message

  Traceability: ARMY, 20 July 1996
  Priority ???

- Delete Messages

  Traceability: ARMY, 20 July 1996
  Priority ???

- Validat Prescript Data

  Traceability: ARMY, 20 July 1996
  Priority ???

- Prescript Files Generation

  Traceability: ARMY, 20 July 1996
  Priority ???

- Generate Training Configuration

  Traceability: ARMY, 20 July 1996
  Priority ???

3.3 External Interface Requirements

3.3.1 Alert Services External Interface Requirements

The Alert Services modules shall provide an open, public software interface (API) between the applications programs and all Alert Services capabilities (see Figure 1).

Traceability:
Priority ???

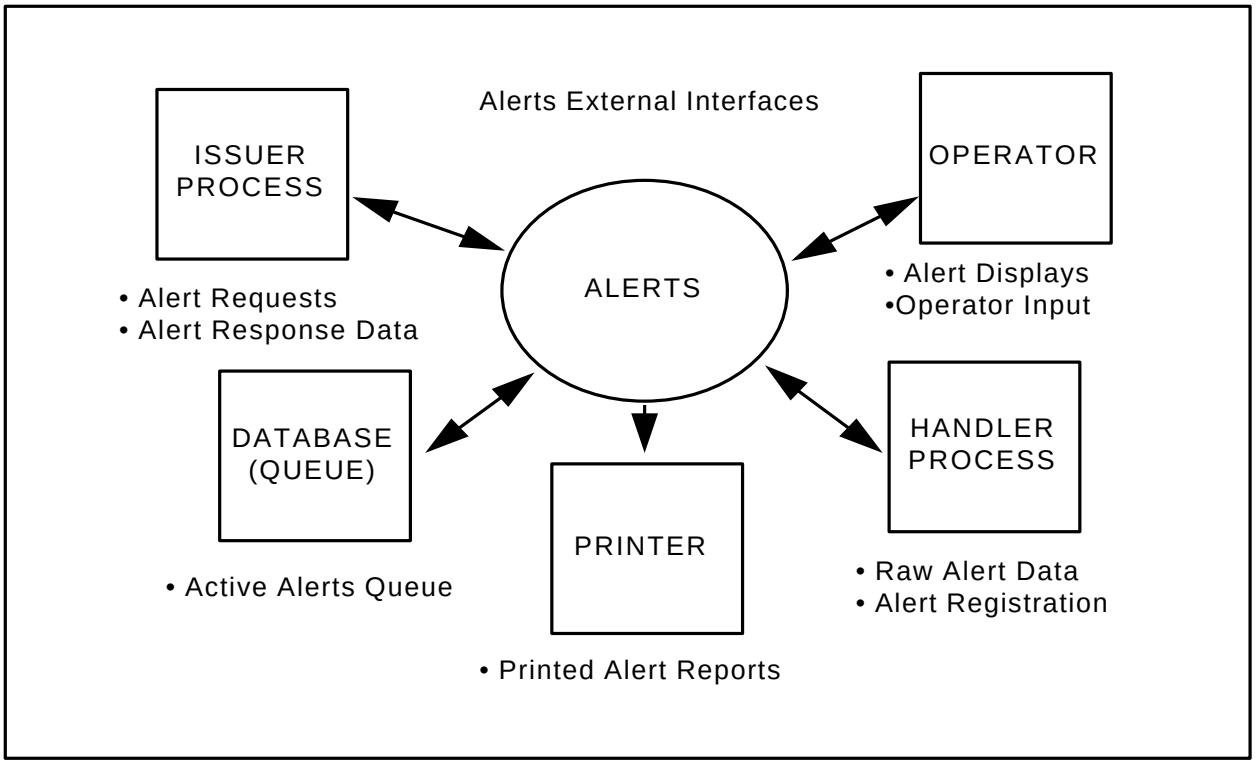

Figure 1. Alerts Manager External Interfaces

3.3.2 Track Correlation Management Services External Interface Requirements

The following apply to the Track Correlation Managment Services (or System), abbreviated TCMS.

Functionality of the database **shall** include transmission and receipt of messages via Communication Services/Data Exchange Services, and database maintenance via the Data Management Services. This functionality must exist for real-world, simulated, and live-training tracks.

Traceability:
Priority ???

3.3.2.1 Interface Identification and Diagrams

3.3.2.2 Data Retrieval/Update Interface

3.3.2.2.1 Data sources **shall** include TADIXS, OTCIXS, RADAR, ACDS, JSTARS, PLRS/EPLRS, TRAP/TDDS, TIBS, TRIXS, SIPRNET, JWICS, IBS, and TADIL networks. The TCMS **shall** support processing for national system reporting of tactical ballistic missile (TBM) data.

Traceability:
Priority ???

3.3.2.2.2 The TCMS **shall** provide the ability to choose a communications channel for transmission.

Traceability:
Priority ???

3.3.2.2.3 The architecture **shall** support high data rates and large amounts of data. It **shall** be scaleable. As such, no software changes and minimal system modifications **shall** be required to accommodate additional data sources or increases in data bandwidth.
Traceability:
Priority ???

3.3.2.2.4 The TCMS **shall** support dynamically changing bandwidth availability in the backbone WAN.
Traceability:
Priority ???

3.3.2.2.5 The TCMS **shall** track the sensor source at the report level. Any amplifying reports that are generated **shall** also display the source of the information, e.g., link network.
Traceability:
Priority ???

3.3.2.2.6 The TCMS **shall** accommodate multiple tactical receiver data feeds.
Traceability:
Priority ???

3.3.2.3 External Segment Data Interaction

3.3.2.3.1 The TCMS **shall** manage objects and additional information related to tracks, (e.g. overlays, PIMs and SOF/SORTS) and provide links to external applications such as MIDB. These links **shall** provide a path for the external applications to "related objects" with the server and request objects registered by another application. For Forces, the TCMS **shall** maintain relationships between force structures and tracks and tie the tracks to the force distributions.
Traceability:
Priority ???

3.3.2.3.2 The TCMS **shall** support the capability to query remote databases (such as JMIE, Wrangler) for information by vessel name, ID number, ID type, flag, time span, and geographical area. The TCMS **shall** support the ability to select from a list of previously sent queries and to load those parameters.
Traceability:
Priority ???

3.3.2.3.3 The TCMS **shall** support the viewing of track reports received from remote databases. The TCMS **shall** support the comparison of these tracks and merging tracks that have identical track names and DTGs. The TCMS **shall** support the selection and addition of the tracks received from remote databases to the system track database.
Traceability:
Priority ???

3.3.2.3.4 The TCMS **shall** provide correlation engine services to external applications.
Traceability:
Priority ???

3.3.2.3.5 The TCMS **shall** provide a two way linkage between other segments and itself. This linkage will allow data sets to be filtered and distributed to the applications that need them, while maintaining access to the entire data set for every segment.
Traceability:
Priority ???

3.3.2.3.6 The TCMS **shall** support APIs to permit mission applications to perform the following functions:

- Submit a contact report to the correlation service.

Traceability:
Priority ???

- Set event masks to request notification of specific correlation events (e.g. track update events or new track creation events).
  Traceability:
  Priority ???

- Provide a user interface to manually modify selected track attributes.
  Traceability:
  Priority ???

- Merge tracks.
  Traceability:
  Priority ???

- Compare the attribute data in two or more tracks.
  Traceability:
  Priority ???

- Delete selected track history points.
  Traceability:
  Priority ???

- Delete tracks from the track data base.
  Traceability:
  Priority ???

- Return the currently archived track history of a selected track.
  Traceability:
  Priority ???

- Return all attribute data associated with a track.
  Traceability:
  Priority ???

- Return all attribute data associated with any report in the track history.
  Traceability:
  Priority ???

3.3.3 Joint Mapping Tool Kit (JMTK) External Interface Requirements

GCCS working groups are identifying the external interface requirements among the COE areas. The GCCS/JMTK will:

- be implemented using approved system APIs to support integration with the GCCS COE through the mission applications.
  Traceability:
  Priority ???

- be scaleable and provide a path for future upgrades.
  Traceability:
  Priority ???

- provide users the same level of service (i.e., capabilities and responsiveness), regardless of their physical location in the distributed environment).
  Traceability:
  Priority ???

At this juncture, GCCS/JMTK external interface requirements have been identified as shown below.

3.3.3.1 GCCS Internal Infrastructure (COE, Kernel, & Common Support Applications)

These include file management, printing services, presentation services, data interchange services, and database services.

Traceability:
Priority ???

3.3.3.2 GCCS Embedded Functionality

These include multimedia and Web browsers.

Traceability:
Priority ???

3.3.3.3 GCCS Mission Area Applications

- Application Programming Interface (API)

  Traceability:
  Priority ???

- Global Status of Resources and Training System (GSORTS)

  Traceability:
  Priority ???

- Global Transportation Network (GTN)

  Traceability:
  Priority ???

- Joint Defense Intelligence Support Services (JDISS)

  Traceability:
  Priority ???

- Tactical Analysis Replanning Graphical Execution Toolbox (TARGET)

  Traceability:
  Priority ???

Additional interface identification and diagrams will be included in future releases of this SRS as the specific information becomes available.

3.3.3.4 CINC/Service/Agency (C/S/A) Unique Applications

Several Service/Agency unique applications are under negotiation as of this release date. More details will be provided in the next release of this document.

3.3.3.5 Site-Unique Applications

Several site unique applications are in progress. More details will be provided in the next release of this document.

3.3.3.6 Other DoD System Initiatives

Several other DoD system initiatives are currently being reviewed and coordinated. More details will be provided in the next release of this document.

3.3.4 Message Processing External Interface Requirements

3.3.4.1 Message Processing Interfaces

The message processing module interfaces with the COE-supplied Communications module to receive messages for further processing and hands off new messages to the communications module for transmission. The message processing module also interfaces with processes, which include COE-supplied system services, DBMS, user interaction, alerts, etc., for passing processed message information to the system for action. The message processor receives data from system processes for use in message generation. Internally, the message processor interfaces to low level modules to accomplish requirements listed above.

3.3.4.2 Message Processing Interface Identification

MP 3.3.2.1 The message processing module shall interface with the communications area for receipt of and hand off of messages for transmission to external systems

Traceability:
Priority ???

MP 3.3.2.2 The message processing module shall interface with the security administration software for receipt of access control information

Traceability:
Priority ???

MP 3.3.2.3 The message processing module shall interface with the audit software for storage and manipulation of audit information

Traceability:
Priority ???

MP 3.3.2.4 The message processing module shall alternatively provide an interface to a text processing subsystem to generate freetext messages.

Traceability:
Priority ???

MP 3.3.2.5 The message processing module shall alternatively provide an interface to the Office Automation e-mail subsystem for message distribution and introduction of messages to be released.

Traceability:
Priority ???

MP 3.3.2.6 The message processing module shall interface with COE system and application support modules to receive and transmit messages. Specific modules include:

a. Queuing mechanisms (Distributed Computing Services)

Traceability:
Priority ???

b. Alerts

Traceability:
Priority ???

c. Security Services

Traceability:
Priority ???

d. Database Administration

Traceability:
Priority ???

e. MCG&I

Traceability:
Priority ???

f. Office Automation

Traceability:
Priority ???

g. Communications

Traceability:
Priority ???

MP 3.3.2.7 As appropriate, the message processing module shall receive, generate, validate, and distribute the following communications message formats/standards:

a. ACP-126

Traceability:
Priority ???

b. ACP-126 (modified)

Traceability:
Priority ???

c. ACP-127

Traceability:
Priority ???

d. JANAP 128

Traceability:
Priority ???

e. MTS

Traceability:
Priority ???

f. DOI-103

Traceability:
Priority ???

g. ACP-123

Traceability:
Priority ???

h. DD173

Traceability:
Priority ???

i. ACP-127 (modified)

Traceability:
Priority ???

j. IEWCOMCAT

Traceability:
Priority ???

MP 3.3.2.8 The message processing module shall provide an interface to an on-line message storage device

Traceability:
Priority ???

MP 3.3.2.9 The message processing module shall interface with functional applications in order to deliver message data.

Traceability:
Priority ???

3.3.5 Office Automation External Interface Requirements

Many other functional areas within the DII COE use office automation software as part of their overall package. For example, the message processing area incorporates a word processor for message composition and the executive manager incorporates a foldering system for file management. As the office automation functional area permeates the integration of other areas, it is important that each of the other functional areas review and update the requirements contained in the Office Automation portions of this document in order to ensure that the requirements meet their needs.

If DII intends to use common office automation modules throughout the COE, then these other functional areas will need to migrate their current products to the DII office automation suite once the requirements process has resulted in product selection. In addition, any future product upgrade and/or change will require coordination between these functional areas.

Office automation APIs will be published, at the appropriate time, in the DII Developer's Kit. DII COE functional areas which make use of those APIs will document their use in a runtime interface document to facilitate version upgrades or migration from one office automation package to another.

Other areas which have external interfaces include the desktop and the data interchange areas. Data interchange will provide the common interchange formats that the office automation software must incorporate. Data interchange requirements have been set forth in the functional requirements for each of the office automation components.

The office automation software area requires that the desktop area support the Common Desktop Environment (CDE) and the Application Programming Interfaces for Windows (APIW) interfaces. The CDE provides end users with a consistent graphical user interface across their workstations, and software developers with a single set of programming interfaces to desktop integration. CDE also enables users to transparently access data and applications for anywhere on the network. APIW specifies the existing practice for application programming interfaces used by a significant majority of programs: the Microsoft Windows APIs. Work on the specification (currently in draft) is occurring via a Technical Committee which has plans to publish a specification in early 1996.

Traceability:
Priority 1

The Office Automation functional area also requires that the X/Open Single UNIX Specification (SUS) be supported and available to the office automation software within this functional area. The X/Open SUS focuses on application portability and will supersede the currently X/Open Portability Guide 4 (XPG4) .

Traceability:
Priority 1

3.3.6 On-Line Support Services External Interface Requirements

OL 3.3.1 The On-Line Support segment shall employ standard Application Program Interfaces (APIs) to provide interoperability between itself and other applications.

Traceability:
Priority 1

3.4 Internal Interface Requirements

3.4.1 Alerts Services Requirements

AS 3.4.1.1 Distributed Computing Environment (DCE) Remote Procedure Calls (RPCs) shall be used to connect the Alert Servers with Alert Services Clients and DCE Cell Directory Services shall be used to manage the locations of Alert Services servers and backup servers.

Traceability:
Priority ???

3.4.2 Track Correlation Management Services Internal Interface Requirements

3.4.2.1 Within the COE, the Track Correlation Management Service (TCMS) has three primary internal interfaces, with communications, message processing and the tactical plotting components of Mapping, Charting Geodesy and Imagery (MCG&I). Correlation **shall** receive parsed data from the message decoding components of the COE on contact reports and track management directives for processing into the Tdb. Correlation **shall** provide data to message encoding components of the COE for formatting and transmission on contact reports and track management directives aimed at reporting and maintaining the COP.

Traceability:
Priority ???

3.4.2.2 Correlation **shall** make data in the Tdb available to the tactical plotting area of MCG&I for geographic display on top of MCG&I products.

Traceability:
Priority ???

3.4.2.3 The Track Correlation Management Service requires support from communications and message processing services, to include support of the encoding and decoding of high volume binary data streams to include TADIL A, B, J, and other high data rate inputs. This requirement is necessary to achieve the required throughput.

Traceability:
Priority ???

3.4.2.4 The COE should provide support for the aggregation of security label attributes (e.g., hierarchical classification, caveats, codewords, handling instructions).

Traceability:
Priority ???

3.4.3 Joint Mapping Tool Kit (JMTK) Internal Interface Requirements

All internal interfaces will be handled through the API calls.

3.4.5 Office Automation Internal Interface Requirements

The DII Office Automation software packages shall be able to exchange data using cut-and-paste between the applications as well as be able to interchange data via data interchange formats as specified within each package. The requirements for internal data elements within the individual office automation packages are contained in the requirements for each package.

Traceability:
Priority 1

3.4.6 On-Line Support Services Internal Interface Requirements

OL 3.4.1 The On-Line Support segment shall employ standard APIs to provide internal interfaces between all applications.

Traceability:
Priority 1

3.5 Internal Data Requirements

3.5.4 Message Processing Internal Data Requirements

All message processing components shall be automatically derived from an electronic data representation of the associated message standard, when it exists.

Traceability:
Priority ???

3.6 Adaptation Requirements

3.6.1 Alert Services Adaptation Requirements

Alert Services software shall be coded in ANSI Ada 83 and implemented using Open Systems standards. Alert Services shall be designed using portable language constructs. Ported versions of this software are required to execute on designated GCCS platforms (Sun, HP).

Traceability:
Priority ???

3.6.3 Joint Mapping Tool Kit (JMTK) Adaptation Requirements

For Version 3.0, a stand-alone module will be provided to mission application developers to load and index DMA formatted data.

3.7 Safety Requirements

None of the services provided in the Common Support Applications services shall interface with, or defeat the purpose of, safety functions implemented in the host system.

Traceability:
Priority 1

3.8 Security and Privacy Requirements

3.8.1 Alert Services Security and Privacy Requirements

Alert Services shall be designed to operate in a “System High” security regimen. The Alert Services software shall rely on the security policy and capabilities of the user system in which it is embedded.

Traceability:
Priority ???

3.8.2 Track Correlation Management Services Security and Privacy Requirements

The Track Correlation Management system **shall** maintain classification and releasability information for reports, track attributes, and data source. This system **shall** be capable of operating in all security domains within the constraints of the security certification and accreditation process.

Traceability:
Priority ???

3.8.3 Joint Mapping Tool Kit (JMTK) Security and Privacy Requirements

The GCCS/JMTK has no specific security and privacy requirements. GCCS/JMTK will support the marking of appropriate classification, privacy, and copyright levels. System security is assumed to provided by Security Services. DMA will determine data classification and releasability.

3.8.4 Message Processing Security and Privacy Requirements

Security policy enforcement is the responsibility of the Trusted Computing Base (TCB). The COE design assumes that COE Layers 1 and 2 will contain COTS products adhering to either the C2 or B1 levels of operational requirements, as defined in the Trusted Computer System Evaluation Criteria. Satisfaction of security requirements needed to adhere to the COE Security Policy are allocated to trusted COE and COTS components. Processes that can be implemented without exemption from security controls will be labeled as untrusted. Untrusted code is not responsible for enforcing security, but must follow the policy enforced by the TCB. The resulting requirements on untrusted code are derived from the COE security policy.

The objective COE will be integrate into systems intended to be evaluated at the B1 or higher evaluation class. Guidelines for developing trusted and untrusted software should be followed to ease the eventual migration to the multilevel secure system required by DoD. Development guidelines for untrusted and trusted software, respectively, are documented in DoD 5200.28-STD series of documents.

3.8.4.1 Trusted Software Requirements

Exactly which COE components must be trusted can only be determined based on the COE security architecture. It is the responsibility of the system and application developer to determine how trusted and untrusted COE and COTS components are integrated. The requirements below address functionality that must be trusted in order to meet COE security processing requirements.

MP 3.8.1.1 If the message processor is responsible for appending information labels based upon “actual classification labeling” vice system higher water mark, then it shall demonstrate compliance with the B1 evaluation class in a manner that provides data integrity and security protection as defined in DoD 5200.28-STD.

Traceability:
Priority ???

MP 3.8.1.2 If the Message-Based SRI module evaluates and routes based on classification levels, and is responsible for trusted output then it shall demonstrate compliance with the B1 evaluation class in a manner that provides data integrity and security protection as defined in DoD 5200.28-STD.

Traceability:
Priority ???

MP 3.8.1.3 In a system using target COE and providing C2 security, the Message Set Classification public operation shall provide advisory security labels in support of manual downgrade of messages.

Traceability:
Priority ???

MP 3.8.1.4 In a system using target COE and providing C2 security, the Message Get Classification public operation shall provide advisory security labels in support of manual downgrade of messages.

Traceability:
Priority ???

MP 3.8.1.5 In a system using objective COE and providing B1 security, the Message Set Classification process shall be implemented in a trusted process and shall be valid only when invoked by a trusted subject.

Traceability:
Priority ???

3.8.4.2 Untrusted Software Requirements

Untrusted software is impacted by security enforcement imposed by the TCB. The first element of security enforcement is Mandatory Access Control (MAC) on information flow between components: Multilevel security is transparent to untrusted software in that untrusted code has no knowledge of security labels maintained by the TCB. However, MAC in multilevel secure systems restricts data flow between system components. This will impact the way in which various trusted and untrusted COE and COTS components are integrated into the system's architecture. For example, all users of an untrusted application may be required to operate at an application-high security level. The second element of security enforcement is the restriction of privileges for individual components. Untrusted software uses only the standard operating system and supports software services that require no special privileges.

In addition to the security enforcement imposed by the TCB, a secure system provides a small selection of security features that are visible and available to untrusted software. Where appropriate, COE provides interfaces to these features.

The following are general processing requirements for untrusted Message Processing Area:

MP 3.8.2.1 Any distinct untrusted processes in the Message Processing Area (e.g., functions not linked into application code) that communicate with one another shall run at the same security level.

Traceability:
Priority ???

MP 3.8.2.2 Untrusted software shall use only the standard operating system and support software services that require no special privileges.

Traceability:
Priority ???

MP 3.8.2.3 If the underlying COTS software provides security features that are visible to untrusted applications, then untrusted COE components shall make available an interface to those features.

Traceability:
Priority ???

3.8.4.3 Accountability

All transactions that occur within the message processor module, and those that occur between the message processor module and external modules will be accounted for. The method for providing this accountability is by use of an audit trail. To support this audit trail, the message processor module shall:

MP 3.8.3.1 Output an audit record for each occurrence of a user definable transaction (user here refers to an authorized administrator with access to system configuration files and audit trail).

Traceability:
Priority ???

MP 3.8.3.2 Record the following with every audit record:

a. Date and time of event

Traceability:
Priority ???

b. Event

Traceability:
Priority ???

c. Security markings

Traceability:
Priority ???

d. Success or failure

Traceability:
Priority ???

e. User ID

Traceability:
Priority ???

f. Duty position/role

Traceability:
Priority ???

MP 3.8.3.3 Record the following with every message-related audit record:

a. Date and time of message origination (DTG)

Traceability:
Priority ???

b. Subject/Message Id

Traceability:
Priority ???

c. Message Originator

Traceability:
Priority ???

d. Message Destination

Traceability:
Priority ???

e. Security Classification (including codewords/nicknames and handling caveats)

Traceability:
Priority ???

f. Message identification and number

Traceability:
Priority ???

MP 3.8.3.4 Provide the capability to audit the following types of events:

a. Beginning and ending of a message database session.

Traceability:
Priority ???

b. Access to messages in the message processing module database.

Traceability:
Priority ???

MP 3.8.3.5 Provide a protection mechanism for audit data such that read and modify access is limited.
Traceability:
Priority ???

3.8.4.4 Access

Access rights shall be controlled and supplied by the Security Administration software.
Traceability:
Priority ???

3.8.4.5 Labels

Information labels are required to be attached to every object within a system, if that system is required to maintain a relationship between information within the system and the actual classification of the data (see paragraph 3.2.1.3 for additional information). If a system is to be evaluated and accredited to operate at the B1, or higher, level of certification the message processor shall:

MP 3.8.5.1 Attach an information label(s) to each object created.
Traceability:
Priority ???

MP 3.8.5.2 Create information labels IAW DIAM 65-19.
Traceability:
Priority ???

3.8.4.6 Marking

Security marking shall be applied to all data when exported to a hardcopy device IAW DIAM 65-19.
Traceability:
Priority ???

3.8.4.7 Data Continuity

3.8.4.8 Data Integrity

Data integrity shall be retained through protection of data such that the data is not exposed to accidental or malicious alterations or destruction
Traceability:
Priority ???

3.8.4.9 Object Reuse

Object reuse shall be in conformance with DoD 5200.28.
Traceability:
Priority ???

3.8.4.10 Contingency Planning

3.8.4.11 System Architecture

The message processor software module shall conform to the COE architectural design philosophy and constraints.

Traceability:
Priority ???

3.8.4.12 System Integrity

3.8.5 Office Automation Security anf Privacy Requirements

The current trend in DII is to build systems in compliance with a common infrastructure made up of interoperable and reconfigurable components. To ensure that components plug-and-play, the infrastructure and target system architectures are standards-based. To reduce life-cycle costs, DII will incorporate commercial off-the-shelf (COTS) components and open systems standards.

From a security standpoint, there are a number of issues given a COTS-based approach. First, the pedigree of COTS products is unknown and thus the assurance and functional capability of the documented (and undocumented) security features and mechanisms are suspect. Without detailed design information, the approach to security risk management, certification, and accreditation of COTS products focuses on testing to see if one can defeat a product's security mechanisms rather than on design analysis. Common product and standards knowledge and misconfigurations make COTS products more vulnerable to hackers. This threat increases the need to strictly configure and manage systems, since reconfiguration can provide further opportunities for attack. The effectiveness of information security depends on careful configuration of components, continuous security monitoring, and user training.

Security functionality provided by an information system must be complemented by security controls from other disciplines, including physical, administrative, and procedural security. In particular, the operational effectiveness of information security functionality depends on how well it is administered and used, and hence, on operational procedures and user security training. Furthermore, the use of a common infrastructure will result in a greater exposure to attacks and will increase the importance of strictly configuring and managing the infrastructure since reconfiguration could provide new opportunities for attack.

The DII Office Automation software shall be capable of being configured, operated and maintained in accordance with the DII Management Services functional area requirements. These requirements include accountability, availability, confidentiality and integrity. For further definition of these requirements and how they apply to the COTS products selected for the office automation functional area, refer to DII Security Requirements Document.

3.8.6 On-Line Support Services Security and Privacy Requirements

OL 3.8.1 On-Line Support services, in determining classification levels, shall take into account the sensitivity of data to be offered and, once implemented, shall comply with Multilevel Security (MLS) standards.

Traceability:
Priority 1

3.9 Environment Requirements

3.9.1 Alert Services Environment Requirements

Alert Services must be portable and is required to execute on all hardware-operating system variants of the GCCS platforms.

Traceability:
Priority ???

3.9.3 Joint Mapping Took Kit (JMTK) Environment Requirements

Ultimately, the GCCS/JMTK is to be hardware independent and operate on a range of open system platforms running under standards-based operating systems designated by GCCS (Refer to Paragraph 3.10.3.1 below).

3.9.4 Message Processing Environment Requirements

3.9.4.1 Software requirements

The Message Processor is intended for use across multiple hardware platforms and operating systems in support of the DoD implementation of the Common Operating Environment (COE), a cost reduction strategy affecting development and maintenance of software and Interoperability.

Minimum software requirements for successful hosting are:

- UNIX Operating System
- X11R5
- Motif Windows manager (MIT version)
- Communications front end for receipt and release of record traffic

Discussions with Service representatives have highlighted the need to support message preparation and parsing in the DOS/Windows environment until transition to the GCCS selected product is completed.

3.10 Computer Resource Requirements

3.10.2 Track Correlation Management Services Computer Resource Requirements

The TCMS **shall** be compatible with the DII COE hardware platforms.

Traceability:
Priority ???

3.10.2.1 Computer Hardware Requirements

Throughput and performance of the Tdb and associated correlation processes **shall** be sufficient to maintain near real time performance with the data arrival rates capable of being presented across the external interfaces listed in Section 3.3.2.2.1. This includes both the automatic correlation throughput, and the distribution across the LAN/WAN.

Traceability:
Priority ???

3.10.2.2 Computer Hardware Resource Utilization Requirements

3.10.2.3 Computer Software Requirements

3.10.2.4 Computer Communications Requirements

The TCMS **shall** support the storage, management, and display of tracks that are shared between WAN activities across the battlespace, local to an organization's LAN, or restricted to a particular terminal.

Traceability:
Priority ???

3.10.2.4.1 Local Terminal

The TCMS **shall** provide backup access to the Tdb server, and shared memory will be restored when necessary due to data loss.

Traceability:
Priority ???

3.10.2.4.2 Inter-DB synchronization

The TCMS **shall** support two principle track management servers. In order to prevent loss of data in the event of a server failure, these databases must be synchronized; i.e. hot server backup.

Traceability:
Priority ???

3.10.2.4.3 Information Broadcasts

3.10.2.4.3.1 The TCMS **shall** allow the transmission of selected tracks to another location using the Communication Service. All track types, including ambiguities, may be transmitted. The TCMS **shall** permit either one track or a group of tracks to be transmitted.

Traceability:
Priority ???

3.10.2.4.3.2 When transmitting track reports, in support of COP processing, the TCMS **shall** be able to support identifying the tracks by their local track numbers or by their Unique ID.

Traceability:
Priority ???

3.10.2.4.3.3 The TCMS **shall** provide the option of sending the track data in compressed or expanded format. Compressed format reports **shall** contain additional information relevant to the individual track, while expanded format **shall** contain additional information.

Traceability:
Priority ???

3.10.2.4.3.4 The TCMS **shall** provide the option to send history information with the track report or to send only the last reported position for the track. The TCMS **shall** support sending only basic track information or an expanded set of information.

Traceability:
Priority ???

3.10.2.4.4 Information Alerts

3.10.2.4.4.1 Alert management: The TCMS **shall** provide a centralized rule base to support track alert management. The concept is to remove the burden of identifying alerts from the clients and

manage this task from the central server. Each application **shall** be capable of adding/inputting alert rules, the server **shall** identify them and alert the application of exceptions when they occur. Alerts may be overridden or augmented by mission applications.
Traceability:
Priority ???

3.10.2.4.4.2 Special Interest: The TCMS **shall** provide a database that supports the generation of reports for tracks that are marked as being of special interest. The TCMS **shall** maintain a status of "suspect" and "nonsuspect" for operator-selected tracks. The designation of "suspect" will indicate that these tracks are of special interest. This designation may be applied and removed by appropriate authorities in the network. An ALERT field in a track's edit window will be used to make this designation.
Traceability:
Priority ???

3.10.2.4.4.3 The TCMS **shall** also provide a mechanism for transmitting the suspect/nonsuspect indication between activities via the Communication Service.
Traceability:
Priority ???

3.10.2.4.4.4 The TCMS **shall** provide for identification of suspect tracks on the tactical display.
Traceability:
Priority ???

3.10.3 Joint Mapping Tool Kit (JMTK) Computer Resources Requirements

The GCCS/JMTK will be compatible with GCCS-specified platforms and operating systems.
Traceability:
Priority ???

3.10.3.1 Computer Hardware Requirements

There is no hardware specific to the GCCS/JMTK. The GCCS/JMTK will be an opern system capable of running on any GCCS COE approved platform. The approved Commercial Off-the-Shelf (COTS) platforms for GCCS 2.0 are Hewlett Packard (HP) 9000/7000 series workstations and SUN SPARC 10/20/1000/2000 series workstations running under UNIX based operating systems. Future GCCS machines in tentative order are: RISC 6000, DEC Alpha, and Silicon Graphics Incorporated (SGI).

3.10.3.2 Computer Hardware Resource Utilization Requirements

The developers of the GCCS/JMTK components have provided their minimum requirements for running their software. The workstations need 64 megabytes of RAM and two gigabytes of hard disk storage.

3.10.3.3 Computer Software Requirements

The currently approved operating systems are Solaris 2.4, HP/UX 9.07, and Windows/NT 3.51. Future operating system upgrades anticipated include Solaris 2.5, AIX 4.1, Digital Unix, and SGI IRIX. In addition to the operating system software, the following software items are recommended for using the GCCS/JMTK:

- X-Windows X 11R5
- Motif: Version 1.2 or most recent
- C compilers current versions for HP, Sun, and the GNU compiler

3.10.3.4 Computer Communications Requirements

The GCCS hardware and software components will be configured to meet specific user needs. MCG&I data can be accessed through GCCS/JMTK functional server via local access, LAN/WAN access or Global Broadcast techniques. WAN access allows for access via the Global Broadcast System and DMA's Global Geospatial Information and Services program. The data services domains have two major components which are Accesses/Gateways and Management. GCCS/JMTK computer communications requirements are being considered in the design of the GCCS architecture.

3.10.4 Message Processing Computer Resource Requirements

3.10.4.1 Computer Hardware Requirements

COE software capabilities will be developed for the following platforms (A platform is a selected pairing of Computing Hardware and an Operating System):

a. Army CHS product list
b. Navy TAC IV product list

3.10.4.2 Computer Hardware Resource Utilization Requirements

Minimum hardware requirements for successful hosting of the current implementation are:

- 32 MB Random Access Memory (RAM)
- 30 MB hard disk space available

3.10.4.4 Computer Communications Requirements

MP 3.13.1 The message processing module shall use UNIX and DCE computer communications services to route messages, journal messages, and parsed data to the appropriate directory or application.
Traceability:
Priority ???

MP 3.13.2 The message processing module shall use the COE Communications Services Area to route messages across a Wide Area Networks (e.g., Mobile Subscriber Equipment (MSE) and Combat Net Radio (CNR)).
Traceability:
Priority ???

3.10.6 On-Line Support Services Computer Resource Requirements

3.10.6.1 Computer Hardware Requirements

OL 3.10.1.1 The On-Line Support segment shall run on all platforms approved for GCCS COE implementation.
Traceability:
Priority 1

3.10.6.4 Computer Communication Requirements

OL 3.10.4.1 The On-Line Support segment shall run on isolated terminals as well as on LANs and WANs.
Traceability:
Priority 1

3.11 Software Quality Factors

3.11.1 Alert Services Quality Factors

Alert Services must be designed using portable language constructs. Ported versions of this software are required to execute on all hardware-operating system variants of the GCCS platforms.

Traceability:
Priority ???

3.11.3 Joint Mapping Tool Kit (JMTK) Software Quality Factors

The software quality factors that have already been put in place by the Military Services for CHART, CMTK and TEM that are represented in the GCCS/JMTK will be assumed.

3.11.5 Office Automation Software Quality Factors

Office Automation capabilities shall be portable and reusable.

Traceability:
Priority 1

3.12 Design and Implementation Constraints

3.12.1 Alert Services Design and Implementation Constraints

As Alert Services is to be implemented as common software module within the DII COE, the developers can make no assumptions about the “look and feel” of the user interface for the system in which it eventually will be embedded. Therefore, the “Display” portion of Alert Services must be implemented as a generic display tool, to be used solely for demonstration purposes, testing, and as a coding example for Alert Services clients.

Traceability:
Priority ???

3.12.2 Track Correlation Management Services Design and Implementation Constraints

The TCMS **shall** consist of a client-server architecture. Two versions of the primary server **shall** be supported on the same LAN with database commonality. This is necessary to support master-to-master data exchange. Two separate systems **shall** be capable of existing in two separate states and **shall** therefore utilize independent servers to support event by event communications on each.

Traceability:
Priority ???

3.12.2.1 Structure independent data access

The APIs **shall** be designed in a manner that supports longevity and compatibility. This **shall** be achieved through a design which creates and enforces a barrier between data structures and the calling application. The calling routine **shall** require no knowledge of the systems data structures.

Traceability:
Priority ???

3.12.3 Joint Mapping Tool Kit (JMTK) Design and Implementation Constraints

GCCS/JMTK will be compatible with GCCS-specified platforms and operating systems. Presently, GCCS COE release 2.X consists of Sun Solaris Version 2.4 and HP UX Version 9.0.7 with OS compatible versions of X-windows and Motif. The goal is that GCCS/JMTK be compatible with GCCS COE documentation and guidelines and eventually support the GCCS objective architecture.

3.12.4 Message Processing Design and Implementation Constraints

MP 3.12.1 The message processing module shall provide upwardly compatible interfaces between COE versions of the Message Processing Area and application programs.
Traceability:
Priority ???

MP 3.12.2 The message processing module shall provide upwardly compatible functional services Message Processing Area in COE versions to applications programs.
Traceability:
Priority ???

MP 3.12.3 The message processing module shall be portable across Government Furnished Equipment/ Government Furnished Information (GFE/GFT) common hardware and software platforms.
Traceability:
Priority ???

MP 3.12.4 The design and implementation of the message processing module shall conform to the COE architecture.
Traceability:
Priority ???

MP 3.12.5 The message processing module shall incorporate an open systems architecture design, in accordance with that defined by the Global Command and Control Systems (GCCS) Common Operating Environment (COE) to allow integration with other applications/systems.
Traceability:
Priority ???

MP 3.12.6 The message processing module shall operate in a Distributed Computing Environment (DCE).
Traceability:
Priority ???

MP 3.12.7 The message processing module shall allow for future growth/expansion and portability through early definition and stability of Application Programmer Interfaces (API).
Traceability:
Priority ???

MP 3.12.8 The message processing module shall be designed to support operations of selected modules (those required for message generation) in a DOS/Windows environment.
Traceability:
Priority ???

3.12.5 Office Automation Design and Implementation Constraints

Versions of the Office Automation functional area modules shall operate on the required DII hardware platforms running the specified operating systems. Currently, DII supports the following platforms and operating systems:

1. Hewlett-Packard (HP) 900/700 Series workstations running HP-UX v9.01 and HP-UX v10.0

2. Sun Microsystems (Sun) SPARC workstations running Solaris v2.4 and v2.5
3. Intel workstations running Windows NT and Windows 95 (supported as clients only).

Therefore, office automation products which are selected for use in the DII COE must be available for these platforms.

Traceability:
Priority 1

3.12.6 On-Line Support Services Design and Implementation Constraints

OL 3.12.1 The On-Line Support services shall be implemented by approved system APIs only.
Traceability:
Priority 1

OL 3.12.2 The On-Line Support services shall be upgradable to incorporate future help additions to attain the goal of software reusability.
Traceability:
Priority 1

OL 3.12.3 For future versions, the On-Line Support services shall be backward-compatible.
Traceability:
Priority 2

3.13 Personnel-Related Requirements

3.13.3 Joint Mapping Tool Kit (JMTK) Personnel-Related Requirements

The GCCS/JMTK will conform to accepted human factors guidelines and practices to support ease of use, training, and performance.

3.13.4 Message Processing Personnel-Related Requirements

MP 3.14.1 All message preparation instructions and help text shall be provided to the drafter/user by the message processing module.
Traceability:
Priority ???

MP 3.14.2 The message processing module shall provide on-line and interactive help (context sensitive).
Traceability:
Priority ???

MP 3.14.3 Service unique help shall be provided if adequate information is supplied by the services in a format compatible with USMTF CDBS standard.
Traceability:
Priority ???

MP 3.14.4 The human interface shall be developed IAW the DoD Human Interface Design Handbook.
Traceability:
Priority ???

3.14 Training-Related Requirements

3.14.3 Joint Mapping Tool Kit (JMTK) Services Training-Related Requirements

Training for all GCCS/JMTK user personnel must be in accordance with the GCCS Training Plan through approved GCCS training courses.

3.14.6 On-Line Support Services Training-Related Requirements

Refer to Requirements OL 3.2.3.1 through OL 3.2.3.3.

3.15 Logistics-Related Requirements

3.15.3 Joint Mapping Tool Kit (JMTK) Logistics-Related Requirements

DMA will provide software support for the GCCS/JMTK. The DISA Engineering Office will distribute the GCCS/JMTK.

3.15.5 Office Automation Logistics-Related Requirements

All software shall be made available and distributed in accordance with the DII COE Integration and Runtime Environment Specification, V2.0.

Traceability:
Priority 1

3.16 Other Requirements

3.16.5 Office Automation Other Requirements (Interoperability Requirements)

Interoperability is the ability to move data and information across networks. One of the reasons for migrating to a reduced number of systems is to improve interoperability between systems. With many different systems performing similar functions, it is an extremely difficult task to ensure that all the system deployed will be able to inter operate. By reducing the variety of systems proliferated, the problem of interoperability between systems is also reduced to a more manageable challenge.

In addition to integrating the office automation capabilities it is also important that the data produced by the office automation modules can be imported and exported in a suitable format. The requirements for the import and export of data within the individual office automation packages are contained within the functional requirements for each package.

The DII Office Automation software suite shall inter-operate such that each of the packages can exchange data and information across the network. In addition, the DII Office Automation software shall inter-operate, as needed, with all other DII functional areas.

Traceability:
Priority 1

3.17 Packaging Requirements

3.17.1 Alert Services Packaging Requirements

3.17.1.1 Alert Services Shipping Protection Provisions

The developer shall prepare all items for shipment with preservation packaging and marking such that protection is provided against deterioration and physical damage during shipment and handling from the source of supply to the ultimate destination.

Traceability:
Priority ???

3.17.1.2 Alert Services Media

All releases from the developer shall be provided on removable storage media (e.g., tape, CD-ROM, or magneto-optical disks) consistent with GCCS equipment. The developer shall provide all releases in both source and object format, as well as segmented in accordance with the GCCS Integration Standard.

Traceability:
Priority ???

All software shall be delivered in accordance with the DII COE Integration - Runtime Environment Specification, V2.0 (Draft).

Traceability:
Priority 1

3.18 Precedence and Criticality of Requirements

The order of precedence or criticality indicating the relative importance of the requirements in this specification are identified and prioritized in Section 5, Requirements Traceability.

CHAPTER 4. Qualification Provisions

This section identifies the qualification provisions including the methods used to ensure that the requirements in Section 3 have been met.

COE Software will be qualified through formal validation tests of the SRS level requirements. The Qualification Methods applied to the software shall include Test (T), Demonstration (D), Analysis (A), and Inspection (I).

- **Test**: A qualification method that is carried out by operation of the item/component/interface (or some part of the computer software configuration item, etc.), and that relies on the collection and subsequent examination of data; the collection of data can be done using instrumentation or other special test equipment.
- **Demonstration**: A qualification method that is carried out by operation of the Item/component/interface (or some part of the software configuration item, etc.), and that relies on observable functional operation not requiring the use of elaborate instrumentation or special test equipment.
- **Analysis**: A qualification method that is carried out by the processing of accumulated data. An example of accumulated data is the compilation of data obtained from other qualification methods. Examples of the processing of accumulated data are interpretations or extrapolations made from the data. Examples are reduction, interpretation, or extrapolation of test results.
- **Inspection**: A qualification method that is carried out by visual examination, physical manipulation, or measurement to verify that the requirements have been satisfied. This may involve the visual examination of code, documentation, etc.

Special qualification methods may also be applied to the item/component/interface (or some part of the software configuration item, etc.), such as special tools, techniques, procedures, facilities, and acceptance limits.

4.1 Alert Services Qualification Provisions

All requirements associated with Alert Services will go through Formal Qualification Test (FQT).

Requirements 3.2.1.1 through 3.2.1.24 in Section AS 3.2.1 will go through Test. Requirements 3.2.2.1 through 3.2.2.25 in Section AS 3.2.2 will go through Demonstration.

4.1.1. Validation Levels

Software Development Testing will be performed in the Software development test environment unless otherwise specified or agreed to with PM GCCS. The software Development Test levels are Software Object Tests, Software Subsystem Tests and Software System Tests. Test documentation is maintained by the developers and testers in Software Development Folders (SDFs). Development Tests parallel the required formal tests allowing the Development Test software (Testware) to be reused for the Final Qualification Tests (FQTs).

4.1.1.1 Software Object Tests

Software Object Tests are the lowest level of test. Software Objects represent a complete software capability and have one or more defined public operation(s). "Software Object Test" is used instead of "Computer Software Component (CSC) Test" in MIL-STD-498. At this level, each software test examines off-nominal behavior and behavior at boundary conditions as well as the expected "nominal" behavior.

4.1.1.2 Software Subsystem Tests

Software Subsystem Tests verify the functional requirements for integrated software objects that implement one of the separate software products in the end system. These "Software Subsystem Tests" correspond to the "Computer Software Configuration Item (CSCI) Test" in MIL-STD-498.

4.1.1.3 Software System Tests

Software System Tests verify the functional requirements and operational behavior of the integrated software subsystems that implement the end system. The "Software System Tests" correspond to the "System Integration Test" as used in MIL-STD-498.

4.1.1.4 FQTs

FQTs are used to validate requirements stated at the software SRS level. The FQT is executed by personnel from an independent testing organization working with a configuration-controlled target system environment. FQTs are witnessed by government personnel and/or their authorized proxies.

4.1.2 Alert Services Responsibility for Qualification

Software testing will be performed by the provider of the software candidate objects. The degree of development testing vs. testing performed during productization and integration of existing software will be established by the software provider in concert with GCCS.

4.1.2.1 Development Tests:

Development testing is performed by the developers who implement the software products. These tests may be observed (informally) by government representatives. The developer Quality and Configuration Management organization certifies at the conclusion of development tests that the software is ready to be formally qualified.

4.1.2.2 Formal Qualification Tests:

FQTs must be performed by an independent test organization. These tests must be observed on a formal basis by government representatives. These tests will follow a successful test readiness review. FQTs may be incremental. software items failing the FQT are returned to the developer for correction.

4.1.2.3 Regression Tests:

Regression tests will be performed, as required, by the CS material developer to ensure that the software is (again) ready for formal testing when upgrades and/or bug fixes have been incorporated.

4.1.3 Alert Services Access to Software Developer Facilities

Government representatives may participate in design and code reviews and walk-throughs and in all testing activities. Such participation will be coordinated with the contractor who will grant access to contractor and subcontractor facilities.

4.3 Joint Mapping Tool Kit (JMTK) Qualifications Methods

GCCS/JMTK will be qualified through formal validation test of the SRS level requirements on GCCS COE specified hardware platforms and operating systems. The components will be tested by the developers prior to their delivery to DMA. DMA will perform integration on the software provided by

the participating Services in order to provide serviceable software to satisfy the GCCS MC&G requirements.

Only Demonstration is currently being projected for qualification.

4.4 Message Processing Qualification Provisions

The message processor and its message definition data tables require joint testing and approval by the Joint Interoperabilty Test Center (JITC) for USMTF standard compliance. Message Processing qualification methods are detailed in Table 1.

Requirement	Paragraph ID	Qualification
MESSAGE STATES AND MODES	3.1	Demo & Test
MESSAGE INBOUND PROCESSING	3.2.1	
INTERNAL ROUTING	3.2.1.1	Demo & Test
MESSAGE PARSER	3.2.1.2	Demo & Test
INFORMATION LABELING	3.2.1.3	Demo & Test
SRI PROCESSING	3.2.1.4	Demo & Test
MESSAGE PROFILING	3.2.1.5	Demo & Test
MESSAGE OUTBOUND PROCESSING	3.2.2	
MESSAGE GENERATION	3.2.2.1	Demo & Test
AUTO GENERATION	3.2.2.1.1	Demo & Test
INTERACTIVE GENERATION	3.2.2.1.2	Demo & Test
FORMAT SELECTION	3.2.2.1.3	Demo & Test
MESSAGE COORDINATION AND RELEASE	3.2.2.2	Demo & Test
MESSAGE PROCESSING SUPPORT SERVICES	3.2.3	
SYSTEM CONFIGURATION	3.2.3.1	
START UP	3.2.3.1.1	Demo & Test
TERMINATION	3.2.3.1.2	Demo & Test
ERROR HANDLING	3.2.3.2	Demo & Test
AUDIT	3.2.3.3	Demo & Test
RETROSPECTIVE SEARCH	3.2.3.4	Demo & Test
NORMALIZATION	3.2.3.5	Demo & Test
BOM TO COM CONVERSION	3.2.3.6	Demo & Test
MESSAGE DATA TABLES	3.2.3.7	Demo
MESSAGE VALIDATION	3.2.3.8	Demo & Test
MULTI SECTIONED MESSAGES	3.2.3.9	Demo & Test
MESSAGE ANNOTATION	3.2.3.10	Demo & Test
MESSAGE RETRANSMISSION	3.2.3.11	Demo
OPERATIONAL JOURNAL	3.2.3.12	Demo & Test

Table 1. Message Processing Qualification Methods

CHAPTER 5. Requirements Traceability

This section addresses Traceability of each requirement.

In most of Section 3, each requirement has Traceability information which traces that requirement to a corresponding source document; in some cases, the requirement is also traced to an organization, i.e., (working) group, that was responsible for developing that requirement.

The documents are:

FRD Functional Requirements Definition

Each requirement has also been assigned a Priority for the implementation of that requirement. The priority provides direction to COE developers.

1. A priority one(1) requirement (Essential) must be met in version 3.0 of the COE.
2. A priority two(2) requirement is desirable (Desirable) for version 3.0 of the COE.
3. A low priority three(3) usually indicates that the rrequirement is optional (Optional) for version 3.0 of the COE; it is usuaally assigned to requirements that are necessary for the COE to operate in a MLS mode.

All communications requirements with a priority of one(1) are essential in both nominal and degraded modes of operation; services to perform communications and networking are essential in both modes.

Communications requirements that have a priority of two(2) are desirable functions to be performed in the nominal mode, but are not necessary in the degraded mode and can be halted.

CHAPTER 6. Notes

This section contains acronyms, abbreviations and a list of terms and definitions needed to understand this document.

6.1 Acronyms and Abbreviations

ACDS	Advanced Combat Direction System
ACINT	Acoustic Intelligence
ADRG	Equal ARC Digitized Raster Graphics
ADRI	Equal ARC Digital Raster Imagery
AGCCS	Army Global Command and Control System
AIA	Air Intelligence Agency
ANSI	American National Standards Institue
API	Application Programmer's Interface
	Application Programming Interface
ACINT	Acoustic Intelligence
AGCCS	Army Global Command and Control System
AIA	Air Intelligence Agency
AID	Aeronautical Information Data
AITS	Adopted Information Technology Standards
AOI	Area of Interest
API	Application Programming Interface
ASRD	AWIS Software Requirements Document
ATCCS	Army Tactical Command and Control System
AWIS	Army WWMCCS Information System
BFACS	Battlefield Functional Area Control Systems
BGDBM	Battle Group Database Management
C2 or C&C	Command and Control
C4I or C^4I	Command, Control, Communications, Computer, and Intelligence
CAC	Compressed Aeronautical Chart
CADRG	Condensed Equal ARC Digitized Raster Graphics
CASS	Common ATCCS Support Software
CBI	Computer Based Instruction
CCM	Cross Country Movement
CDS	Combat Direction System
CHART	Charting and Mapping Module (US Navy)
CHS	Common hardware/Software
C/I/A	CINC/Service/Agency
CIB	Controlled Image Base
CMS	Common Mapping Standard
CMTK	Common Mapping Toolkit
COE	Common Operating Environment
COMINT	Communications Intelligence
COP	Common Operational Picture
COTS	Commercial Off-The-Shelf
CSC	Computer Software Component
CSCI	Computer Software Component Item
	Computer Software Configuration Item
DAFIF	Digital Aeronautical Flight Information File
DCE	Distributed Computing Environment
DCHUM	Digital Chart Updating Manual
DCW	Digital Chart of the World

DFAD	Digital Features Analysis Data
DIA	Defense Intelligence Agency
DIAM	Defense Intelligence Agency Manual
DID	Data Item Description
DII	Defense Information Infrastructure
DISA	Defense Information Systems Agency
DISNET	Defense Integrated Secure Network
DMA	Defense Mapping Agency
DoD	Department of Defense
DoDIIS	Department of Defense Intelligence Information Systems
DT	Datum Transformation
DTED	Digital Terrain Elevation Data
DTG	Date Time Group
DVOF	Digital Vertical Obstruction File
Dynapath	Dynamic Programming Path
ELINT	Electronic Intelligence
ELNOT	ELINT Notation
EPLRS	Enhanced Position Location Reporting System
FLIR	Forward Looking Infrared
FQT	Formal Qualification Test
FRD	Functional Requirements Document
GCCS	Global Command and Control System
GENSER	General Services
GEOREF	Geographic Reference
GMTI	Ground Moving Target Indicator
GOTS	Government Off The Shelf
GPS	Global Positioning System
GSORTS	Global Status of Resources and Training System
GTN	Global Transportation Network
HCI	Human-computer interface (TAFIM, Vol. 8)
H/W	Hardware
IAW	In Accordance With
IBS	Integrated Broadcast System
ICM	Incoming Communications Manager
IDB	Interoperability Database
IOC	Initial Operating Capability
ITD	Information Technology Division Interim Terrain Data
JDISS	Joint Defense Intelligence Support Services
JMCIS	Joint Maritime Command Information System
JMIE	Joint Maritime Intelligence Element
JMTK	Joint Mapping Tool Kit
JROC	Joint Requirements Oversight Council
JSTARS	Joint Surveillance and Target Attack Radar System
JWICS	Joint Worldwide Intelligence Communications System
LAN	Local Area Network
LE	Linear Error
LLLTV	Low Light Level Television
LND	Land
LOS	Line-of-Sight

MASINT	Measurements Intelligence
MCG&I	Mapping, Charting, Geodesy, and Imagery
	Mapping, Charting, Geopositioning, and Imagery
MCS	Modernized Catalog System (DMA)
MGRS	Military Grid Reference System
MIDB	Modernized Intelligence Database
MLS	Multi-Level Security
MOS	Modular Operating System
MTI	Moving Target Indicator
MTST	Maneuvering Targets Statistical Tracker
NITF	National Imagery Transmission Format
NSA	National Security Agency
OOB	Order of Battle
OTCIXS	Officer-in-Tactical Command Information Exchange Subsystem
PIF	Pseudo-Identification Feature
PIM	Path of Intended Movement
PITD	Planning Interim Terrain Data
PLRS	Position Location Reporting System
POS	Point of Service
PPDB	Point Positioning Data Base
PRI	Primary
	Pulse Repetition Interval
PVOD	Probabilistic Vertical Obstruction Data
RAD	Rapid Applications Development
RADAR	Radio Detection and Ranging
RF	Radio Frequency
RPC	Remote Procedure Call
RPF	Raster Product Format
SAR	Synthetic Aperture Radar
SCAN	Scan Type Code
SCI	Sensitive Compartmented Information
SCONUM	Ship Control Number
SDBMS	Spatial Database Management System
SDE	Software Development Environment
SDF	Software Development Folder
SENSOREP	Sensor Report
SIPRNET	Secret Internet Protocol Router Network
SLF	Standard Linear Format
SMC	Surface Material Code
SOF	Status of Forces
SORTS	Status of Resources and Training System
SPAWAR	Space and Naval Warfare Systems Command
SPM	Signal Parameter Manager
SQL	Structure Query Language
SRS	Software Requirements Specification
	System Requirements Specification
SUB	Submarine
TARGET	Tactical Analysis Replanning Graphical Execution Toolbox
TADIL	Tactical Digital Information Link
TADIXS	Tactical Data Information Exchange Subsystem
TBM	Theater Ballistic Missile
TBS	To Be Supplied

TCMS	Track Correlation Management Services Track Correlation Management System
Tdb	Tactical Database
TDB	Track Database
Tdbm	Track Database Manager
TDBM	Track Database Manager
TDDS	Tactical Data Dissemination System
TDP	Tactical Data Processor
TEM	Terrain Evaluation Module (US Army)
TIBS	Technical Information Base Tactical Information Broadcast Service
TRAP	TRE and Related Applications
TRE	Tactical Receive Equipment
TRIXS	Tactical Reconnaissance Information Exchange System
UB	Unified Build
UID	Unique Identification
UNIX	Computer Operating System (originally developed by Bell Labs)
USA	United States Army
USAF	United States Air Force
USCG	United States Coast Guard
USMC	United States Marine Corps
USN	United States Navy
UTM	Universal Transverse Mercator
VPF	Vector Product Format
WAN	Wide Area Network
WVS	World Vector Shoreline
WWMCCS	World Wide Military Command and Control System

6.2 Glossary

The following list identifies the terms that are used in this document along with their associated meanings.

Abnormal Termination
Unanticipated shutdown of workstation processes and/or communications activities.

Alert
A software-controlled notification of an exceptional or critical condition. Alerts are usually displayed to the system operator for acknowledgment and corrective action. In this case the usage implies the need of one process to notify another process of an event.

Audit Trail
A set of historical records that traces the transactions and updates to a designated resource (e.g., a database).

Autonomous
Independent, self-managed.

CBI
Instructional service intended to provide users with informal, structured lessons of system operation.

COE
Common Software that provides a framework and standard functionality for the development of C2 systems.

Dynamic
In the COE, dynamic actions are those which may be accomplished without interrupting the ongoing processes on a workstation or network. (e.g., dynamic reconfiguration of a network must occur without taking the network down)

Hardcopy Device
An output device that provides a permanent, printed (or plotted), paper record of application-supplied data.

Job Planning
Service identifying all tasks involved in completion of jobs and required order of execution.

Message
A message is a unit of data conveyed from one communicating software entity to another. No assumptions are made as to the format or content of the message.

MLS
Security concept allowing data access to be controlled by user classification level, not by system level. See “Multilevel Security....”

Network
Multiple workstations connected by a wire or fiber-optic media. Networks may be local (LAN), city-wide or campus-wide (MAN), or wider area up to global (WAN) in coverage.

Object-Level
Term referring to information related to objects (e.g., Help button) within a window.

On-Line Help
Help service focusing on task-specific instruction intended to give users brief coaching tips.

Open Public Interface
A stable programming-language interface to a Common Software function which is published in the Interface Design Document and the Programmer’s Guide.

Pop-Up
A window or menu on a display that seemingly appears “out-of-nowhere”, but is actually the action of an application (which may be reacting to an operator action or may be autonomously displaying data to the operator).

Process
An executing software program. Processes are characterized as a combination of a machine state and an execution space on a workstation. Processes are individually managed by the operating system.

Pull-down
A expanded set of menu selections that becomes visible when the operator selects an associated menu bar entry or menu item. Pull-downs can overlap or cascade.

Queue
An ordered list or data elements that has a predefined organization and access scheme.

Standard Message
A formatted ASCII text message from the USMTF, ACCS or STANAG Message Sets.

Window
An application-managed X-System widget that provides a data display or operator dialog area.

Window-Level
Term referring to information relating to all elements and features within a window.

Workstation
A processor and its associated storage, display, communications, and operator i/o devices, taken as a whole. (e.g., HCU, TCU, LCU -- CHS Workstations).

6.3 Standard Verbs

A set of unambiguous transitive verbs has been identified and defined. The verbs have been used in the development of the functional requirements in this specification.

ABORT
Terminating an activity prematurely.

ACCEPT/REJECT
Receiving data that is judged to satisfy a requirement, and the reverse.

ACCESS
Reading or writing data structures from a mass storage device.

ACKNOWLEDGE
Reporting the receipt of a message and whether the message was with, or without errors to the originator of the message.

ACTIVATE/DEACTIVATE
Causing a device to begin running, and the reverse.

ADD/MODIFY/DELETE
Manipulating/changing data elements.

ADDRESS
Providing a unique identifier for the receiver of data.

ALLOCATE/DEALLOCATE
Designating storage resources for a specific purpose, and the reverse.

ASSIGN
Giving out a task; delegating responsibility for an activity to a subordinate.

CLASSIFY/DECLASSIFY
Associating *a* DoD security classification to an element, and the reverse.

CLOSE
See OPEN/CLOSE.

COMMUNICATE
Sending/receiving messages between logical and/or physical entities.

CONFIGURE
Identifying, and arranging the elements in a group or network.

CONNECT/DISCONNECT
Linking elements across a communications circuit, and the reverse.

CONTRACT
See EXPAND/CONTRACT.

CONVERT
Changing a data element from one form or state to another.

COPY
Duplicating selected data from a screen display. See also CUT and PASTE.

CREATE/DESTROY
Causing a data element to exist, bringing it into being, building it, or producing it, and the reverse.

CUT
Removing selected data from a screen display. See also COPY and PASTE.

DEACTIVATE
See ACTIVATE/DEACTIVATE.

DEALLOCATE
See ALLOCATE/DEALLOCATE.

DECLASSIFY
See CLASSIFY/DECLASSIFY.

DEFINE
Describing the precise nature and qualities of entities (e.g., of a data element, data storage).

DELAY
Suspend processing for some specified finite period of time.

DELETE
1. Causing a record or data element to cease to exist.
2. See ADD/MODIFY/DELETE.

DELIVER
Provide information to the client process for action.

DEQUEUE
See QUEUE/DEQUEUE.

DESELECT
See SELECT/DESELECT.

DESTROY
Causing a data element to cease to exist. See CREATE/DESTROY.

DETERMINE
Evaluating or appraising based upon specific criteria or knowledge base.

DIM
See HIGHLIGHT/DIM.

DISABLE
Stop a designated activity to be performed. See also ENABLE/DISABLE.

DISCONNECT
See CONNECT/DISCONNECT.

DISPLAY
Exhibiting a data element or group of elements on a visual data workstation.

DISTRIBUTE
Dispersing data elements to identified local activities or across a network.

DOWNLOAD/UPLOAD
Transferring data from a superior to a subordinate, and the reverse.

EDIT
Correcting, modifying, or adapting a data element in a controlled manner.

ENABLE/DISABLE
Allowing a designated activity to be performed, and the reverse. See also DISABLE.

ENFORCE
Compelling observance of specified standard of practice.

ENSURE
Performing a decisive action to achieve a desired result.

ENTER
Introducing a data element into the system from an outside source.

ERASE
Replacing all information in a designated storage area with binary ones.

EXCHANGE
Transmitting data and receiving data in return between logical or physical entities.

EXPAND/CONTRACT
Increasing or decreasing size (e.g., computer resource, data structure).

EXPOSE/HIDE
Making data elements on a visual data W/S visible, and the reverse.

FAIL-OVER
Switching seamlessly to a backup device or server process when a failure has been detected in the primary.

FILL
Entering data into pre-defined storage structures (e.g., forms).

FIND/SEARCH
Locating a data element of a designated value or a set of values.

FORMAT
1. Transferring application-specific information (e.g., map regions military symbology, text, etc.) into a form understandable by the underlying graphics package
2. Initializing certain storage media.

FORWARD
Sending received data on to a subsequent destination or address.

HANDLE
Accessing, controlling, or releasing a data element.

HIDE
See EXPOSE/HIDE.

HIGHLIGHT/DIM
Making a data element prominent by altering its visual representation, and the reverse.

IDENTIFY
Ascertaining the identity and/or the nature of a data element.

IMPLEMENT
Proceeding according to a plan or design.

INITIALIZE
To load, and/or make ready to execute, and/or execute in order to establish a set of starting conditions.

INITIATE/TERMINATE
Causing a designated activity or process to begin, and the reverse.

INPUT/OUTPUT
Getting data from a device (not storage) or activity, and the reverse.

LABEL
Applying an annotation to the designated data element.

LIMIT
Restricting the value of a data element to pre-defined boundaries.

LOCK/UNLOCK
Restricting access to data elements or storage areas, and the reverse.

LOG
Recording/printing designated events and selected related information.

MAINTAIN
Preserving designated data elements through correction and updates.

MERGE
Combining sorted data retaining the original ordering scheme.

MODIFY
See ADD/MODIFY/DELETE.

MONITOR
Systematically watching for the occurrence of designated events or data.

NOTIFY
Sending/Returning a message to a designated activity or person.

OPEN/CLOSE
Making the contents of a file visible and accessible, and the reverse.

OPERATE
Functioning effectively according to pre-defined rules.

OUTPUT
See INPUT/OUTPUT.

PARSE
Breaking a compound data element down into components.

PASTE
Redisplaying previously cut or copied data on a screen display. See also COPY and CUT.

PLOT
See PRINT/PLOT.

POLL
Interrogating a server to assess status, determine availability of data.

POSITION
Placing a data element in the desired location on a display.

PREVENT
Performing a decisive counteraction to stop something from happening.

PRINT/PLOT
Producing hardcopy on a printer or printer/plotter.

PROCESS
Following a series of operations that bring about a result.

PROVIDE
Furnishing or giving access to a designated capability or service.

PURGE
The procedure to totally and unequivocally erase or overwrite all information stored in memory or on magnetic or optical media. Purging is one prerequisite to declassification of media. (Purging is performed on an entire media basis.)

QUALIFY
Meeting specified requirements.

QUEUE/DEQUEUE
Adding an entry (data element) to a queue, or removing an entry from the queue.

READ/WRITE
Getting data from a mass-storage device, and the reverse.

RECEIVE
See SEND/RECEIVE.

RECONFIGURE
Changing or rearranging the elements in a group or network.

REFORMAT
Changing the organization of a data element from one form to another.

REINITIALIZE
Redefining the starting conditions of an activity and restarting it.

REJECT
See ACCEPT/REJECT.

REPOSITION
Moving a data element from one location to another on a display.

RESUME
Restart or continue an activity with the possibility of suspending the activity. See also SUSPEND/RESUME.

RETRIEVE
Finding and bringing back, usually by copying the desired entity.

RETURN
1. Passing data elements to a requesting application program
2. Going back to a predefined location or configuration.

ROUTE
Providing a message destination and/or transmission path.

SANITIZE
Removing selected information for the purpose of changing the classification of a file or object from one classification to another

SEARCH
See FIND/SEARCH.

SECTION
To divide or segment a message into fragments.

SELECT/DESELECT
Choosing from a number of pre-defined alternatives, and the reverse.

SEND/RECEIVE
Transmitting data over a communication link, and the reverse.

SET
Changing the designated data element to the desired value or state.

SORT
Arranging data in a specified ordering scheme.

STORE
Transferring data to a specified storage media.

SUBMIT
Entering a request.

SUSPEND/RESUME
Interrupting an activity with the possibility of restart, and the reverse.

TERMINATE
Causing a designated activity or process to stop. See also INITIATE/TERMINATE.

TRANSFER
Conveying or shifting a data element or message from one location to another.

TRANSFORM
Converting data from one representation to another.

UNLOCK
See LOCK/UNLOCK.

UPDATE
Changing the content of a data element to provide replacement information.

UPLOAD
See DOWNLOAD/UPLOAD.

UTILIZE
Employing the services or functionality of some other specified capability.

VALIDATE
Determining whether a data element should receive official sanction.

VERIFY
Determining whether a data element meets pre-defined criteria.

VIEW
Provide a visual display of information for the operator.

WAIT
Suspend processing until one or more events occur.

WRITE
See READ/WRITE.